McLAUGHLIN

INSTRUCTION BOOK

Light Six Models E-62
E-63

READ CAREFULLY AND
FOLLOW INSTRUCTIONS

VALVE-IN-HEAD
McLAUGHLIN
MOTOR CARS

PRICE 25 CENTS

The McLAUGHLIN MOTOR CAR CO.
LIMITED

OSHAWA, ONTARIO
CANADA

McLAUGHLIN

INSTRUCTION BOOK

FOR

Model E-6-62
E-6-63

SIX CYLINDER

This instruction book contains general information for the operation and maintenance of this car. For any further information, address all inquiries to the Service Department of this Company.

GENERAL INTRODUCTORY.

In presenting a book of instructions to the car owner, many phases of an unusual nature are met.

To presume too much on our part might cause some readers to feel that we have encroached on their former experience, and in this, we have carefully endeavored to point out differences in design and construction for their guidance.

To the car owner who is handling his or her car for the first time we have endeavored to impart that fundamental knowledge which we believe should be acquired to insure the best of service and all of the pleasures that belong to the McLaughlin car owner.

With these ideas in mind we present this instruction book beginning with the owner's receipt of car and leading down to the time when it is necessary to order parts, for replacements, which have worn out after many miles of service.

It is inevitable that certain information will not be found in this instruction book; therefore, we request the car owner requiring such information to address their inquiries to the Service Department of this Company.

It is our intention to give satisfactory information and service to each purchaser of a McLaughlin car and should an owner fail to receive such information and service, we ask in good faith to be so advised.

PART ONE

INTRODUCTORY.

Part one introduces the reader to the various operations that naturally come to his or her attention first, and is divided into the following list of chapters :

PART ONE

OPERATION.

FIRST THINGS TO DO

Receipt of Automobile

Most McLaughlin cars are received from the dealer direct, and in the event that this is not the case, note the following remarks :

Location of Freight Car

After receipt of bill of lading from transportation company, have freight car located opposite an unloading platform with same height as car floor.

Unloading Ways

If an unloading platform is not available secure two extra strong planks with side and end cleats and of such a length that the least amount of grade is secured from freight car to the ground. Place planks 56 inches apart, center to center.

Inspection Of Freight Car Seals

Before removing the automobile from freight car and before signing freight release inspect all car seals and ascertain if these have been broken in transit, and if they have, make a note of the freight car name and number.

Inspection Of Automobile

After freight car is opened inspect the automobile carefully to see there has been no damage en route.

If there has been any damage make a note of same on receiving slip and do not sign for automobile until everything is checked up.

Removing Blocking

Before attempting to move automobile from freight car have all blocking under car removed, taking due care that no nails are left to puncture or cut tires.

Removing Automobile From Freight Car

If possible, have an experienced driver handle the automobile when removing from freight car. The emergency brakes will be found set up hard; release emergency brake hand lever in front compartment.

MAKING READY TO RUN

Battery Terminals

One storage battery terminal to storage battery under front seat will be found disconnected; reconnect, and electrical apparatus will be found ready for use. All water is drained from radiator before shipping from factory.

Filling Radiator

See that pet cocks in water system are closed; one pet cock will be found in cylinder water jacket on left side of engine and another in bottom of radiator.

Fill the radiator with clean water and make sure that radiator is always kept so to prevent engine from overheating and causing unnecessary trouble.

Filling Gasoline Tank

The gasoline tank is located at rear of the automobile and has a capacity of 12½ gallons.

Remove filler cap from gasoline tank in rear of car and insert a funnel equipped with a fine gauze screen. The purpose of the screen in funnel is to prevent any foreign particles from entering gasoline tank which would have a tendency to clog gasoline pipes.

Filling Oil Reservoir

The engine is filled with oil before shipping; however, it is well to test oil level. The oil level indicator, located near the center of engine on right hand side, consists simply of a flat strip of metal which dips into the oil and has marked on its lower end graduations which indicate the height of the lubricant in the pan.

By removing the indicator from tube enclosing it the oil level can be noted and if less than half full cylinder oil should be poured into the opening on left hand side of engine at front end until indicator registers "full."

Operating License

In most cases a license is required before an automobile can be driven on a public thoroughfare; therefore, the new owner should secure a Provincial license or police permit before attempting to do any driving.

Tires

Examine the tires to make sure the requisite amount of air is in them. See detail instructions for tires. Page No. 20.

OPERATING PARTS

(See Figure 1)

Instruments and Control Levers Steering Wheel Horn Button Spark Control Lever and Throttle Control Lever

The various instruments and control levers are shown in Figure 1.

To the left of the driver's position is the steering wheel which controls the course of the automobile.

At the top of steering wheel the electric horn button, spark control and throttle control levers are located.

The electric horn button controls the sounding of the electric horn.

The spark control lever controls the advancing and retarding of the electric spark in the engine.

The throttle control lever controls the speed of the automobile through the carburetor allowing the admission of either small or large quantities of gas to the engine.

Lighting and Ignition Switch Automobile Lock

The electric light and ignition switch is located in front of the driver on the instrument board.

In the center of the switch the lock is located which locks ignition switch in the off position.

This lock assists in preventing the theft of the car.

Carburetor Choker

The carburetor choker is located on the left side of the instrument board in steering post bracket and is used to choke off flow of air to carburetor in starting when the engine is cold. Pull choker button out as far as it will come to fully choke carburetor and after engine starts gradually press button back in place as engine warms up.

Ammeter

The ammeter is mounted on the lighting and ignition switch, the hand of which registers the amount of current charging or discharging the storage battery.

Speedometer

The speedometer is located on instrument board and registers speed of automobile in miles per hour, miles per trip and miles per season.

The knurled wheel permits trip register to be changed to suit conditions by moving to right or left and giving wheel several turns.

The season mileage can not be changed.

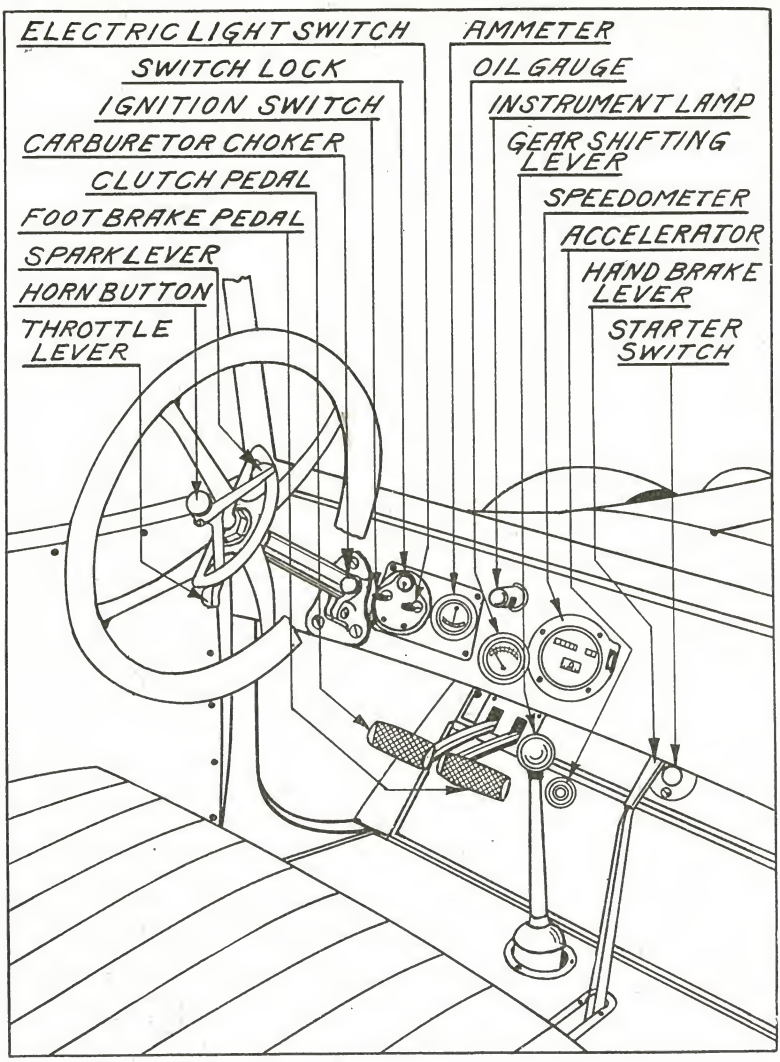


FIGURE 1

View of Instruments and Controls

Clutch Pedal

The clutch pedal is located to the driver's left in the toe board and serves to connect and disconnect the engine and the transmission.

Foot Brake Pedal

The foot brake pedal is located to the driver's right in the toe board and serves when foot is pressed downward to apply service brake on rear wheels, thus stopping the automobile.

Accelerator Pedal

The accelerator pedal is located to the right of foot brake on toe board and serves to increase or decrease speed of engine through its connection to carburetor, when driver's foot is pressed downward or vice versa.

Electric Starting Switch

The electric starting switch is located to the right and above the accelerator pedal and serves when driver's foot is pressed downward to connect storage battery with electric starting motor, causing engine to start.

Gear Shift Lever

The gear shift lever is located in the center of the driver's compartment and serves when shifted to change the speed of the automobile. The different speeds are known as reverse; first; second; and third or high.

Hand Brake Lever

The hand brake lever is located to the right of the gear shift lever and is used to set the emergency brakes on rear wheels, causing the automobile to stop. This brake should always be used when automobile is standing at a curb or on a hill to prevent it from moving.

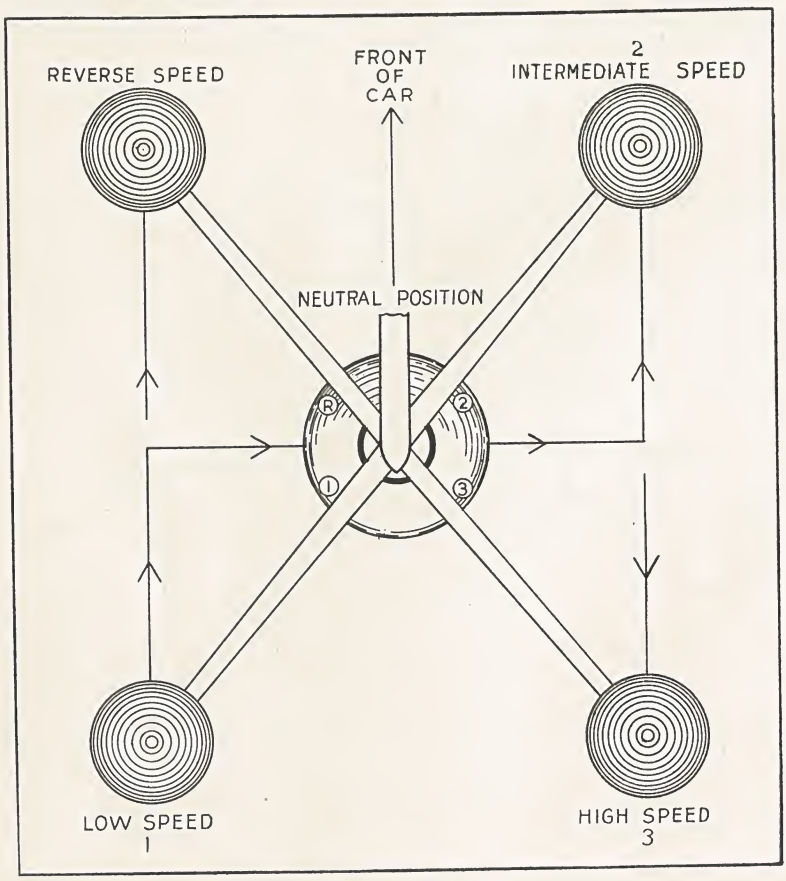


FIGURE 2

Gear Shift Lever Position

STARTING THE ENGINE

Position of Driver and Levers

Take your position in driver's seat behind wheel. Observe position of hand brake lever and see that it is locked back; also see that gear shift lever is in neutral position (See Figure 2). Place throttle control lever about two inches from bottom of sector and spark control about the middle of the sector.

Choker Button Ignition

Pull out choker button as far as possible for cold weather starting. With right hand turn ignition switch button to the right or left.

Starting Switch Button

With right foot press down on starting switch button and hold foot in this position until engine starts, or about a minute at the most.

Release starting switch button the moment the engine starts, push back choker button as engine warms up, and push spark lever two-thirds of the way up from the bottom of sector. Pull down throttle control lever to prevent engine from racing and always keep it at bottom of sector when driving with the accelerator.

Pull the brake lever back a trifle and release the lever pawl by pressing thumb of right hand down hard; then push brake lever forward until brakes are fully released.

(Never fail to release hand brake lever).

Hand Cranking

If for any reason the storage battery should be run down or starting motor fail to work, the engine can be started by hand cranking. Secure starting crank from tool compartment under front seat, remove cap over end of starting crankshaft at front of radiator.

Make sure spark is retarded.

Attach starting crank to shaft (handle down) and push toward engine, at the same time turning crank to the right until jaws of crank and shaft lock; then pull up quickly. Repeat this operation until engine starts.

Do not place handle up and press down, as engine might back fire and cause handle to break your arm.

Running Positions

As soon as the engine starts pull down throttle lever until the engine runs smooth and slow. Advance the spark lever two-thirds of distance up from bottom of sector when both levers will be in running position.

Use the foot accelerator pedal to control speed of engine and automobile for ordinary driving and throttle lever when it is desirable to rest the right foot on long runs without much changing of car speed.

OPPERATING THE AUTOMOBILE

(See Figures 1 and 2)

Position of Driver to Start First Speed

Sitting in driver's seat with left hand gripping steering wheel place right hand on gear shift lever.

With left foot press down on the clutch pedal (see Fig. 1) as far as possible and at same time move gear shift lever (See Fig. 2) to the left and back toward driver to first speed position.

If transmission gears fail to mesh, place gear shift lever in neutral position again and move clutch pedal up and down a couple of times with left foot; then press way down and gears should mesh properly.

Moving Forward in First Speed

With right foot press gently down on accelerator pedal and at the same time gently release pressure on clutch pedal with left foot when automobile will gradually move forward.

Second Speed

After automobile has gone some ten or fifteen feet, again press down clutch pedal with left foot and move gear shift lever to neutral; then to right and forward to second speed position.

Third Speed

Repeat operation of releasing clutch pedal and accelerating the speed of the automobile and again press down clutch pedal and at the same time pull gear shift lever straight back to third speed position in which practically all driving will be done.

If gears in transmission fail to engage with each other, move clutch pedal forward and back very slightly with left foot and at the same time pulling back lightly on gear shift lever into third speed.

Running in Third Speed

With automobile running in third speed it is possible to drive from five miles per hour to the maximum speed of car. However, do not attempt speeding until you are very proficient in your knowledge of handling and driving the car, as ten to fifteen miles per hour at first is the best policy to follow.

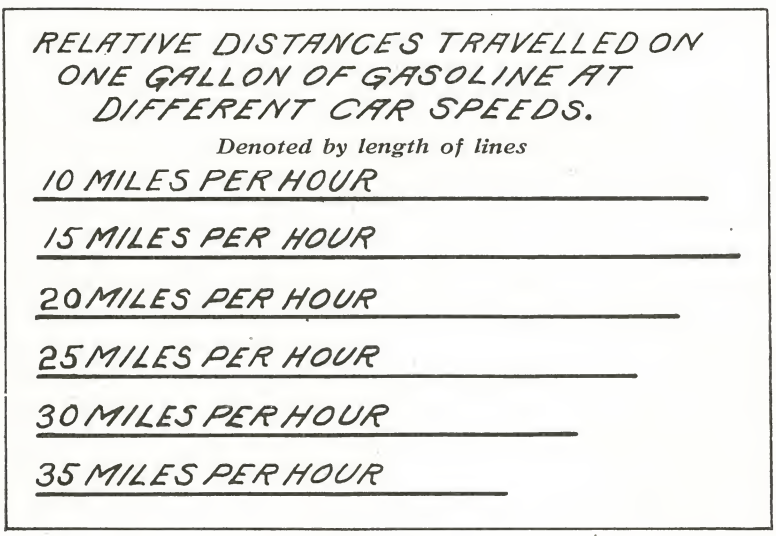


FIGURE 3
Driving Speeds

Economical Operating Speed

The most economical driving speed is between ten and twenty miles an hour; that is, the car can be driven more miles for each gallon of gasoline consumed at those speeds than at any other speed.

Figure 3 shows this clearly.

Stopping the Automobile

Retard the spark and at the same time remove foot from accelerator (this will cause the engine to slow down and act as a brake upon the car speed). After car speed is thus reduced, disengage the clutch with the left foot and at the same time apply the brakes with the right foot. With both feet pressing down on pedals, move gear shif lever forward to neutral position and set the hand brake.

Stopping the Engine

With right hand turn the ignition button to "off" position when electric current to spark plugs will be cut off causing engine to stop. Remove switch key and car will be locked to assist in preventing theft.

Running Automobile Backward

Note previous instructions on first speed except that shift lever moves to left and forward for reverse. Be careful not to back up too rapidly at first. See Figure 2.

Shifting Gears

In shifting gears from one speed to another the motions should be made with firmness and despatch. If the gears fail to mesh at first and a grinding noise is heard don't continue to push or pull on gear shift lever. Gradually work clutch pedal ahead and back so gears will change their relative positions and then move shift lever to desired position.

Never attempt to shift from first to reverse or vice versa while car is moving.

DRIVING OPERATIONS, RULES AND SUGGESTIONS

The Driver and Car

When driving the McLaughlin Model E-63 always try to bear in mind the fact that you are the one who controls the entire situation, and that the car will do what you wish it to. Keep cool headed.

Don't Speed

Don't try any speeding. Drive slowly at first and be sure you have learned to handle the car under all conditions before attempting any speed records. Watch your speedometer and don't let it get above fifteen miles per hour; keep your feet near the clutch and brake pedals and learn to handle the hand brake lever for emergencies.

Circulation of Oil

From time to time glance at the oil indicator (see Figure 1) to see that oil is circulating. For proper pressure see Figure 8.

Release Hand Brake Lever

Take notice that the hand brake lever is pushed as far forward as possible so that the car can run freely and not cause brake linings to burn out.

Watch the Road Ahead

Watch the road ahead and learn to observe objects at a distance as well as close to prevent any chance for an accident.

Turning the Steering Wheel

Turning the steering wheel to the right causes the car to go in the same direction and vice versa.

Learn to turn the steering wheel gradually (not suddenly) thereby causing the car to keep an even straight course ahead or backward.

Stopping the Automobile

With the spark and throttle control levers set in running position and while driving with right foot on accelerator, should you wish to stop the car, remove the right foot from accelerator pedal and press gradually down on foot brake pedal; at same time retard spark lever and press down on clutch pedal and with right hand move gear shift lever to neutral.

Racing Engine

Never race the engine, as this does no good and might do serious harm.

Practicing Gear Shifting and Steering at Various Speeds

One of the things which causes some doubt about any automobile is the shifting of gears, but with a little practice it is soon learned. Follow out instructions already mentioned and at same time observe the speedometer. For instance, in starting with clutch pedal pressed down, accelerate the engine a little after shifting from neutral to first and at same time gradually (never sharply) release clutch pedal and when the car is moving at three to five miles an hour press down on clutch pedal and return the gear shift lever to neutral and then to second speed.

After second speed is reached, again accelerate engine and when car is moving, say ten to fifteen miles per hour again press down on clutch pedal and move gear shift lever to third speed then again release pressure on clutch pedal when by pressing down on accelerator pedal all speeds from five to maximum can be obtained.

Locate a roadway where traffic is not crowded and practice gear shifting, bringing car to full stop, then going ahead again.

then stopping and backing up, then turning corners and you will discover in a very brief amount of time that driving a car is quite simple.

Skidding

If rear end of car skids to the right turn steering wheel slightly to right, and if it skids to left turn steering wheel to left. Retard throttle lever at once and press down on foot brake pedal until engine and car speeds are normal, then release clutch by pressing down on clutch pedal with left foot. The principle thus described is to use engine as a break in connection with brakes on rear wheels and in doing so the rear wheels are permitted to revolve slowly until they stop after disengaging the clutch; thus the entire periphery of tire is used as a brake against the ground and no one spot on tire can become slippery to assist the skidding action of the car.

Ordinary hills do not affect the McLaughlin E-63 and require no special attention.

Hill Climbing and Low Speed Controls

When approaching a very steep hill, speed up the car and as momentum decreases retard spark control lever and if car still slows down change gear shift lever to second and if necessary first speed position. Don't let clutch slip by pressing on clutch pedal, as this will soon wear out the clutch cone facing. The car can climb in first speed any hill that can be climbed by a car, so don't feel afraid to use the lower speed controls and by so doing save the car from undue strains as much as possible.

When stopping on a hill use foot brake pedal with clutch pedal pressed down and at the same time pull hand brake lever hard up, after which move gear shift lever to neutral and release clutch pedal. Don't leave the car on a steep hill without blocking rear wheels and also set front wheels so that in case car does move it will back against side of road.

Going Down Hill

In driving down hill, rather than apply brake, shift back to lower gear speeds, take foot off accelerator and pull down throttle lever, leaving clutch engaged with fly wheel, and by so doing use the engine as a brake, which does not cause any extra wear on the car and saves the brake linings.

Starting Car on Hill

In starting a car on a hill first press down hard on foot brake and clutch pedals and move gear shift lever to first speed, then speed up engine a little with throttle lever on steering wheel after which gradually release hand brake lever, foot brake pedal and clutch pedal when car will start to move forward as desired.

Saving Brake Linings

When stopping on level road brake linings may be saved by using engine as a brake as follows :

Retard spark and throttle levers as much as possible and take foot off accelerator pedal. When car is nearly at desired spot push down clutch pedal and apply foot brake. Before releasing clutch pedal move gear shift lever to neutral.

Rules of the Road

Every driver of a motor car should understand and obey the rules of the road. Briefly stated, they are as follows :

1. When meeting a vehicle going in the opposite direction, turn out to the right.

2. When passing a vehicle going in the same direction, sound the horn and turn out to the left.

N.B.—In the Maritime Provinces and certain parts of British Columbia, Rules 1 and 2 are reversed. Follow local practice in every case.

3. In turning a corner to the right, keep as close as possible to the right-hand ditch or curb.

4. In turning a corner to the left, always continue on past the center of the intersection of the two roads or streets before making the turn.

5. In stopping the car, always stop at the right-hand curb.

6. In meeting another car at night, always dim headlights.

Dont's

1. Don't drive your car until you have read the instructions in this book, as well as those contained in the Remy, Prest-O-Lite and Stewart-Warner Instruction Books.

2. Don't drive fast.

3. Don't drive with your foot on the clutch pedal.

4. Don't let clutch in suddenly.

5. Don't lock rear wheels with brakes except in emergencies.

6. Don't use starter more than half a minute at one time.

7. Don't race motor when idling.

8. Don't use brakes on a long down grade; use engine as a brake as explained on pages 11 and 13.

9. Don't turn off ignition when using engine as a brake.

10. Don't drive on a level road with spark retarded.

1. Don't drive on a flat tire.

12. Don't leave car standing any length of time in freezing weather without draining radiator and engine water jacket.

13. Don't neglect to oil bearings as shown in oiling chart.

14. Don't leave your headlights on bright when passnig another vehicle at night; use dimmer.

15. Don't try to make any adjustments or repairs unless you are sure you understand just what to do.

16. Don't forget to look at your storage battery once a week.

17. Don't forget to see that your headlights are set and focused correctly.

18. Don't fail to fully release hand brake lever.

19. Don't fail to set hand brake lever upon stopping.

20. Don't leave your car without locking switch.

All of the electric lights are controlled by electric light button.

Using the Lights

Turning the button to the right causes all lights to burn bright and turning button to the left causes all lights to burn dim.

Most city and town ordinances require that headlights be dimmed, which is beneficial to other drivers and does not use so much current from the battery.

Focusing Headlights

Headlights may be focused to comply with local or state regulations. This is accomplished by turning the knurled terminal at rear of headlight in a counter-clockwise direction about a quarter of a turn and sliding it in or out. When proper focus is secured let terminal spring back into place.

PART TWO

INTRODUTORY.

Part Two introduces the reader to various subjects pertaining to the maintenance of the particular car.

The subjects taken up under this heading are functions, care, adjustments and repair of parts and are divided into the following chapters :

PART TWO

MAINTENANCE.

Maintenance of Automobile

Maintenance means that the car owner or the one who cares for the car should know what is required to make a car run smoothly and what to do when making adjustments.

The following pages cover the subject of maintenance from the lubrication of the car to instructions for ordering parts for replacement.

We recommend that reader memorize all or as much of the following text as possible, as the quotations will be needed sooner or later.

While we may not agree with others on some subjects we do stand back of our claims as recommended as being in our judgment the best we know of at this time, and suggest that car owner carefully follow this idea.

GENERAL LUBRICATION

(See Figure 4)

The lubrication of an automobile is an item of great importance, and once neglected can cause any amount of hard work and expense. Let two parts that require lubrication become dry from lack of grease or oil and they may become ruined and will have to be replaced with new ones.

Figure 4 shows the plan or top view of the McLaughlin E-63 chassis and every unit requiring any sort of lubrication is marked on this chart.

The following lubrication schedule, page 18, covers every unit that regularly requires oil or grease.

The time and distance of this schedule are taken as the average. If the car is driven more miles than applies against time schedule, then mile schedule governs, and if car is driven a lesser number of miles than time schedule ,then time schedule governs.

As an example, with car on a tour the monthly inspection should be given every 1,000 miles. When not touring, it should be given each month, atlhough car has not been driven 1,000 miles in this amount of time.

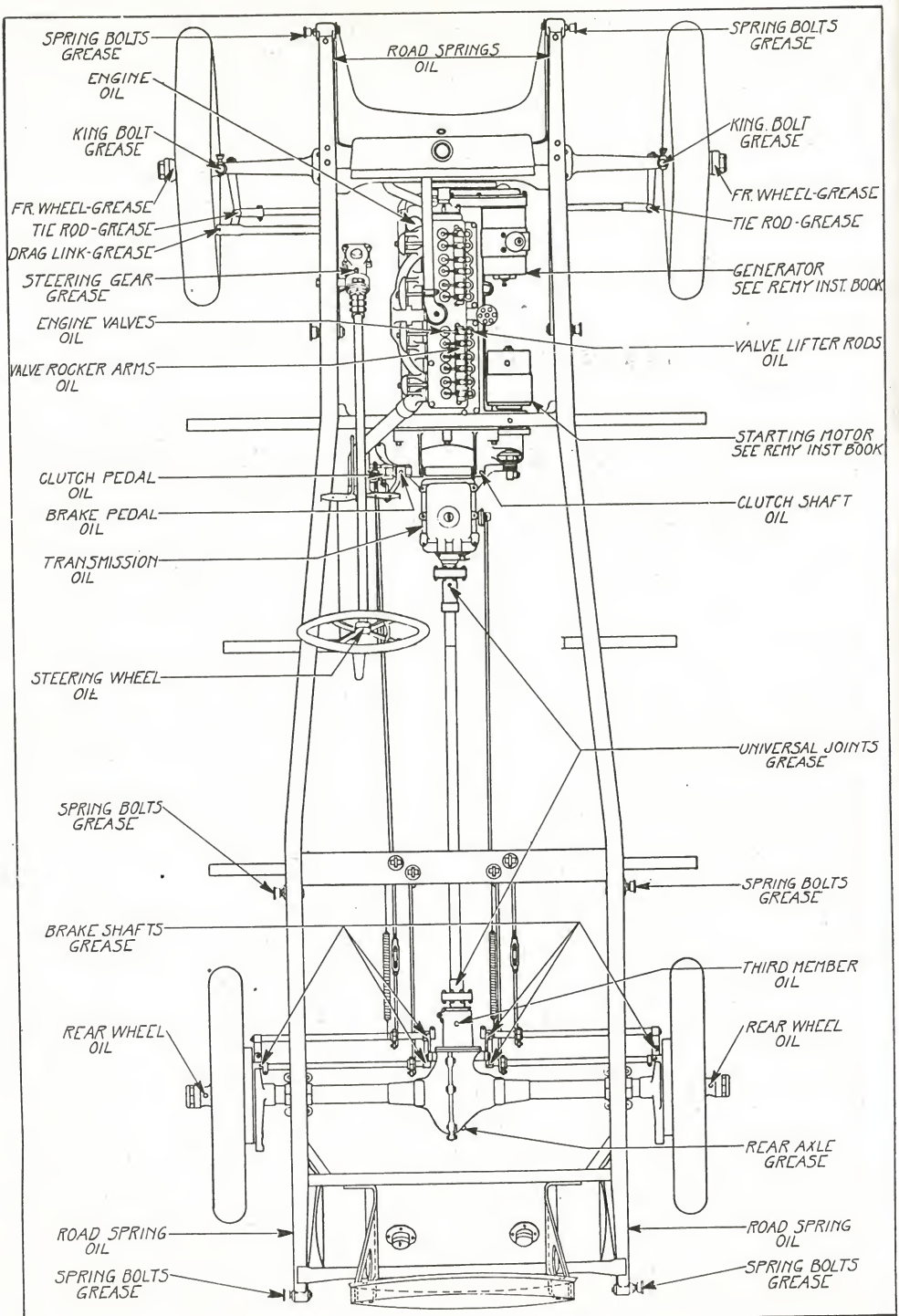


FIGURE 4
Lubrication Chart

LUBRICATION SCHEDULE

How often to Lubricate	Item No.	Parts to Lubricate	No. of places	How Applied	Lubricants
Daily or 100 miles	1	Engine	1	Fill	Engine Oil
Weekly or 500 miles	2	King Bolt	2	Grease Cup	Hard Grease
	3	Tie Rod	2	Grease Cup	Hard Grease
	4	Generator	1	Oil Can	Engine Oil
	5	Engine Valves	12	Oil Can	Engine Oil
	6	Valve Rocker Arms	12	Oil Can	Engine Oil
	7	Valve Lifter Rods	12	Oil Can	Engine Oil
Monthly or 1,000 miles	8	Starting Motor	1	Grease Cup	Hard Grease
	9	Spring Bolts	12	Grease Cup	Hard Grease
	10	Brake Shaft	6	Grease Cup	Hard Grease
	11	Drag Link	2	Pack	Hard Grease
	12	Foot Pedal	1	Oil Can	Engine Oil
	13	Clutch Pedal	1	Oil Can	Engine Oil
	14	Clutch Shaft	2	Oil Can	Engine Oil
	15	Steering Wheel	1	Oil Can	Engine Oil
Quarterly or 3,000 miles	16	Rear Wheels	2	Oil Can	Engine Oil
	17	Front Wheels	2	Pack	Soft Grease
	18	Rear Axle	1	Pack	Soft Grease
	19	Universal Joint	2	Pack	Soft Grease
	20	Steering Gear	1	Pack	Soft Grease
	21	Road Spring	4	Oil Gun	Oil
	22	Third Member	1	Oil Gun	Heavy Oil
	23	Transmission	1	Oil Gun	Heavy Oil
	24	Speedometer Cable	1	Pack	or Grease

GENERAL CARE OF THE AUTOMOBILE

Every day, 50 to 100 miles.

Daily Attention

Each day the driver should attend to the following conditions :

1. See about gasoline in tank. (See Gasoline Gauge).
2. See about engine oil. (See page 27).
3. See that radiator has plenty of water.
4. See that tires are properly inflated. (See page 21)

Every week, 200 to 500 miles.

Weekly Attention

Every week the following should receive the driver's attention:

1. See that the following units are lubricated : (See Fig. 4.) King Bolts, Tie Rod, Generator, Engine Valves, Valve Rocker Arm and Valve Lifter Rods.
2. Test storage battery and if necessary add some distilled water. (See Prest-O-Lite Instruction Book).
3. Wash and polish car. (See page 18).
4. Examine tire for cuts. (See page 20).

Every month, 600 to 1,000 miles.

Monthly Attention

Each month the driver should be careful to note the following, as the operation of the car after driving several hundred miles demands that these matters receive attention to assure proper performance thereafter. Unless the driver is mechanically capable it is advisable to secure the services of a good garage man to take care of the monthly maintenance.

1. Drain oil from engine and refill with fresh oil; clean screens in pump if necessary. (See page 29.)

2. See that all bolts and nuts throughout the car are tight.

3. Examine entire lubrication system and with oil can lubricate windshield hinge, body locks and hinges and all other parts that might cause any squeaks due to parts rubbing each other when dry.

4. Test compression of cylinders and if necessary have carbon removed and valves reground. (See page 26).

5. Examine fan belt and tighten if necessary. (See page 35).

6. Examine water circulating system for leaks; see that gaskets are tight, drain cocks closed, and tighten hose clamps; also flush out radiator and refill.

7. Examine Starting Motor and Generator. (See page 31).

8. Examine all wires and remove dirt and grease with rag saturated with gasoline. Never do this when engine is running, as electric spark might ignite gasoline in rag.

9. Remove spark plugs and clean with gasoline. Note that gaskets are perfectly tight after replacing spark plugs.

10. See that all electric connections are tight. Examine all wires to see that they do not chafe or rub against some part of car which might cause a short circuit in electric current.

11. See that the following units are lubricated : (See page 17). Rear wheels, front wheels, rear axle, universal joints, steering gear, road springs, third member and transmission.

GENERAL OVERHAULING

Branch Distributors and Dealers Facilities

After an automobile has been driven several thousand miles it may be necessary to give it a general overhauling. It is impossible to state when an automobile will require a general overhauling, as each car owner or driver has to be considered and naturally nearly every case is different. We recommend that the car owner interview one of our branches, distributors or dealers in the matter of overhauling the car and secure an estimate of the cost, as in most cases they are equipped to do this work.

WASHING AND POLISHING

Nickel Enamel and Varnished Trimming

The nickel trimmings, enameling, painting and varnishing of the McLaughlin E-63, receive careful attention by the makers and it is most natural that the car owner should wish to keep the car looking new and bright as long as possible.

Keeping the Car Looking New

To keep the car looking clean extreme care must be taken not to house the car where chemicals which are injurious to nickeled parts, enameled or varnished parts are kept, for if such be the case the bright finish of the car will be ruined.

Use Cool Water

During the hot weather use plenty of cool, clean water to rinse down the varnished parts, since cool water tends to harden the varnish.

Washing and Polishing Supplies

Secure the following list of supplies for washing and polishing the car :

Two soft wool sponges.
Two ten quart pails.
Two large pieces of chamois.
A quantity of cheese cloth.
One bar of Ivory or Castile soap.
One wool duster.
One whisk broom.

One can of nickel polish.
One can of body polish.
One pail of soft soap.

Flushing with Hose

If possible, use a hose to flush the car instead of a pail of water and sponge. Play the stream of water from hose, not too strongly on dusty or muddy parts until dirt softens up and washes off.

Removing Dirt Spots

Secure some gasoline and a piece of cheese cloth and remove spots from the car by rubbing very gently.

Use Water and Soap

After flushing with hose and removing dirt spots from radiator hood, fenders and body, take a pail full of water and add to it some sofe soap and go over the chassis and wheels, removing all grease and dirt in this manner.

After washing chassis and wheels with soap and water again flush with cold water.

Using Chamois on Body, etc.

Take another pail full of clean cold water and with chamois polish the radiator, hood, fenders and body. Don't use this chamois for polishing the chassis. After the foregoing take another piece of chamois and polish the chassis.

Remember to change the water in the pail frequently, using clean water at all times.

Rinse and wring the chamois often so that no grit nor dirt can scratch the polished surfaces.

Washing Engine

The engine and other parts under hood can be washed with soap and water. Take time to thoroughly dry electric connections after washing, as wet connections are apt to cause a short circuit and then trouble.

Nickeled Surfaces

To prevent nickeled surfaces from tarnishing rub frequently with an oily cloth. This preserves the brightness.

Use Body Polish

After the car has been in use some time the lustre will become dull even after washing and polishing with chamois, therefore a good enamel renewer and polish to renew the bright lustre is desirable.

Avoid these in Polishes

Be very careful if you wish to retain the lustre of your car not to use a polish which contains turpentine, kerosene, vinegar, muriatic acid or other free trade acids or ingredients harmful to a fine finish.

Washing Leather Upholstery

The leather upholstery of car should be washed occassionally with ivory soap and water, using a sponge to rinse off soap and then finish drying with a moist piece of chamois.

Leather and Gasoline

Never use gasoline on leather cushions as gasoline will cause it to crack and peel.

Position of Top, Up and Down

The top material will retain its shape without wrinklnig if left up continuously. If top is to be let down be careful not to allow cloth to get creased between top bows and sockets.

Cleaning Top and Curtains

To clean top and curtain material use ivory soap and water and rinse with wet sponge. Never use gasoline to clean top curtains, as it will destroy the rubber in the fabric.

Always allow top to dry first, in up position, before folding down, to prevent mildew and creasing of fabric.

CARE AND REPAIR OF TIRES

Tire Mileage

Many motorists get from 6,000 to 10,000 miles from their tires, while others get only 3,500. This being true it will be to the McLaughlin E-63 owner's advantage to observe the following remarks on this subject :

Road and Longevity

Tire mileage varies in different localities and cities.
Smooth roads and pavements mean longevity to any tire.
Rough roads, ruts, stones and gravel wear the tire faster.

Tire Dont's

Don't drive with under-inflated tires.
Don't neglect the little cuts in the tread.
Avoid severe jolts. Go over bumps slowly.
Don't carry spare tubes unprotected. Put them in a bag.
Don't stop suddenly, except in emergency.
Don't drive with wheels out of alignment.
Don't fail to use French talc powder in casing.
Don't run in ruts or scrape against the curb.
Don't drive in street car tracks.
Don't allow grease, oil or acid to remain on the tires.
Don't allow the rims to rust.
Don't fail to keep spare tires in a cover.

Hitting Hard Obstacles

A great deal of tire trouble is caused by a tire hitting a rut, stone curb or other hard object and ultimately the tire becomes soft or blows out.

Soft Tires Due to Blow-outs Use Reinforcement Patch

Whatever the cause, the fabric of tire has been cut on the inside, while the outside of tire shows no signs of trouble due to elasticity of the outer rubber. Use a reinforcement patch by applying to inside of tire casing. One side of patch is coated with raw gum. By washing with gasoline the gum is softened and will adhere firmly to tire casing. One side of the patch is bare fabric and will not stick to the tube.

Position of Front Wheels

The treads of tires are rubbed off due to wheels not having proper gather. With wheels set improperly the tire undergoes a diagonal grind as it passes over the ground. Make sure wheels have correct gather as soon as unusal wear in tire is noticed. (See remarks under "Camber and Gather in Front Axle.") Sometimes the

Re-assembly of Rims

rims are re-assembled on the wheels wrong after leaving factory; see that wheels and tires run true.

Running Tire Flat

Running tires flat quickly ruins a tube. It is ground and cut as sides of casing are crushed between the metal rim and the ground.

Inner Tube Blow-out

The motorist is surprised, sometimes, when driving on a good road to have a blow-out and upon investigation finds a long slit cut in the inner tube.

Carelessness in Applying Adding Air to Tubes

This is caused by not putting the inner tube in carefully and as a result it becomes pinched between the outer casing and the rim. To assist in preventing a case of this kind, after placing the tube in tire, pump in a small amount of air and then apply to the rim.

Bent or Rusty Rims

Dented or rusty rims cause some tire troubles. A rim which has been struck on the side and dented may cut the casing. A rusty rim becomes rough and chafes the tires, the rust eats rubber and eventually moisture penetrates the fabric and causes it to decay.

Rim-Cuts

Occasionally casings are rim cut. This is due to under-inflation.

Chafed Side Walls

When a tire is run in car tracks or ruts the side walls are exposed to sharp obstacles, and being the thinnest part of the tire are soon cut or chafed.

Avoid such places and chafed side walls of tires will not occur.

Cracked Tires

Cracked tires are mostly due to light and heat. When rubber is continuously exposed to light its liveliness is lost and it hardens and cracks.

Age of Tires

Age has no effect on tires if they are kept in a dry, cool, dark place.

Cover Spare Tires

Tires should always be covered when carried separately on the car.

Storing Tires

Tires should always be stored carefully during the winter months. By doing so the motorist will add materially to his tire mileage.

Leaky Valve Punctured Tire Remove Rim

If tires become soft, stop at once and investigate. Don't run on a soft tire. See if valve is leaking, and if so, use a valve cap to tighten it. If tire is punctured be sure to pull out piece that has punctured the tire as soon as you find it. Jack up the car and remove rim and tire, then remove tire from rim, using rim tool. (See remarks under "Rims," (page 48.)

Remove Tube from Tire

After removing rim from tire remove tube from casing being very careful that tube is not damaged in this operation.

Repairing Tube

Locate hole in tube and sandpaper the rubber around it large enough to take the rubber patch that is to be applied.

Coat tube around hole with cement; also coat patch with cement and apply after both surfaces have become tacky. Press together five minutes.

Use Tire Gauge

The surest way to determine if tires are inflated properly is to use a good tire gauge.

Average Tire Pressure

First and foremost keep the tire properly inflated. Remember the car rides on air—not on the side-walls of the tires. To insure long life and protection against bruises, snags and blow-outs, tires must contain enough air to support the car's weight.

The best average pressure for McLaughlin Light Six is 55 pounds front and 65-70 pounds rear; these pressures are recommended where car carries ordinary five passenger load. If extra weight in form of passengers or equipment is added, tire pressure should be raised accordingly.

Expansion of Air in Tire

Always keep tires at specified pressures in all kinds of weather. Heat does not affect pressure of air in tires enough to be noticed. When pumping up a tire the air becomes warm or hot and may expand 3 to 6 pounds in a given tire; therefore, allow gauge to register 5 to 10 pounds over, as the actual tire pressure will be less as air in tire cools. Tires have been tested to several times specified pressure in pounds without damage; therefore, always have enough air in tires, rather than too little.

PRECAUTIONS FOR COLD WEATHER

Climatical Conditions

Climatical conditions form a big part in the running of any automobile.

It is very desirable that all conditions for winter or cold weather driving approach as near as possible to the condition of warm weather driving, especially where the radiator, engine and carburetor are concerned.

Anti-Freeze

Water in engine and radiator is very apt to freeze in cold weather; therefore, to prevent this from occuring fill the radiator with an anti-freezing solution. A good anti-freeze solution consists of half clear water and half denatured alcohol with 4 to 6 ounces of glycerine added to prevent alcohol from evaporating. Be careful in using advertised solutions, as some of these are known to be detrimental in their effects and are sure to cause trouble.

Radiator Cover

The car, if allowed to stand without engine running in extremely cold weather, should be equipped with some sort of engine and radiator cover which has a tendency to retain the heat under the hood.

Engine Efficiency

Choker Button

The engine's efficiency is at it's best when reasonably warm. When starting the engine in cold weather always pull out choker button as far as possible to cut off flow of cold air to carburetor, thus allowing engine to draw practically clear gasoline from carburetor. This eliminates the necessity of priming the engine with gasoline through spark plug holes.

Carburetor Hot Air Connections

The carburetor has a hot air pipe connected to it from the exhaust manifold.

Relation of Heat to Carburetor

As the hot gasses from the engine pass through the hot air jacket of carburetor it causes the air and gasoline in carburetor to heat up and as a result a better mixture of air and gasoline is received in each engine cylinder and permits the engine to run in the normal way. As engine warms up after running some time, press the choker button gradually back into place.

Open Pet Cocks in Water System

Unless an anti-freeze solution is used, the water system should be thoroughly drained by opening pet cocks in bottom of radiator and left hand side of engine. When all the water has been drained off, start engine and run for a minute or two to assist in thoroughly draining the system. This is not necessary if an anti-freeze solution is used.

Lighter Lubricants

Besides the effect on water, cold makes all lubricants less fluid, and consequently lighter lubricants should be used in cold weather than in warm weather.

STORAGE OF CAR

Storage Conditions

When a car is to be stored away it is advisable to find some suitable place that is fairly dark and free from dampness and where the temperature is fairly even at all times.

Jack Up Car

Jack up both ends of car so that tires are off the floor. Wrap tires with cloth to prevent any light striking them, or, better still, remove them from the wheels and store in a dark place.

Corrosion

Oil all metal parts to prevent corrosion.

Lubricate Cylinders

Remove spark plugs and insert some engine oil in cylinders, then crank over engine so as to thoroughly lubricate piston and cylinder walls.

Grease spark plugs and reassemble.

Storage Battery

It is imperative that battery be left charged while car is layed up. Never expose the battery to cold if it is not going to be used. A partly charged battery is very liable to freeze and become ruined.

See battery instruction book for further information.

Keep the entire car covered with a cloth.

ENGINE

(See Figure 5)

Type of Engine

The motive power of a gasoline car is supplied by the engine.

The McLaughlin E-63 engine is known as a four cycle, six-cylinder, water-cooled, overhead valve type.

To explain the meaning of four cycle; it takes two complete turns of the crank shaft or four complete strokes of the piston to complete a cycle.

Starting with the piston at the top of its stroke we have the following train of events :

1. Suction Stroke.

The Four Strokes

Intake valve open. Exhaust valve closed. Piston moves down, drawing a mixture of gasoline and air into the cylinder from the carburetor.

2. Compression Stroke.

Intake and exhaust valve closed. Piston moves up compressing the mixture of gasoline and air. When piston reaches the top of its stroke an electric spark issues from spark plug and explodes the mixture.

3. Working Stroke.

Intake and exhaust valve closed. The force of expanding gases after the explosion forces the piston downward.

4. Exhaust stroke.

Inlet valve closed; exhaust valve open. The piston moves upward, causing burned gases to pass out of cylinder through exhaust opening, thereby clearing cylinder for a fresh mixture.

During the complete cycle it is noticed that only one stroke is a power stroke, the others being used up to prepare for the power stroke.

Various Systems of the Engine

This cycle is carried out in each of six cylinders, thereby giving six working strokes for every two revolutions of the crankshaft, which causes an even flow of power and giving an even engine torque at all times.

The engine has six separate systems, all independent of each other, though each one is working in unison with the others. They are as follows :

1. The Power System.
2. The Lubricating System.
3. The Gasoline System.
4. The Ignition System.
5. The Water Circulating System.
6. The Exhaust System.

THE POWER SYSTEM

(See Fig. 5)

Units of Power System

The power system consists of the cylinder en bloc casting, cylinder head, piston, connecting rod, crank shaft, cam shaft, timing gears, fly wheel and inlet and exhaust valves.

En-bloc Casting Cylinder Head and Cap Screw

The cylinder en-bloc casting requires no attention.

The cylinder head is fastened to cylinder casting with several cap screws. Between these two parts there is a metal gasket to prevent any leakage from cylinders, so cap screws should always be kept screwed down tight.

Piston and Connecting Rods

The piston and connecting rods are assembled together.

To the piston is fitted two piston rings which retain the compression in cylinder and require no attention.

Connecting Rod and Piston Pin

The connecting rod is fastened to the piston by the piston pin, the latter being held in the connecting rod by a clamping screw.

There are no adjustments between piston and connecting rod beyond the fact of the wear between piston and piston pin they require no attention.

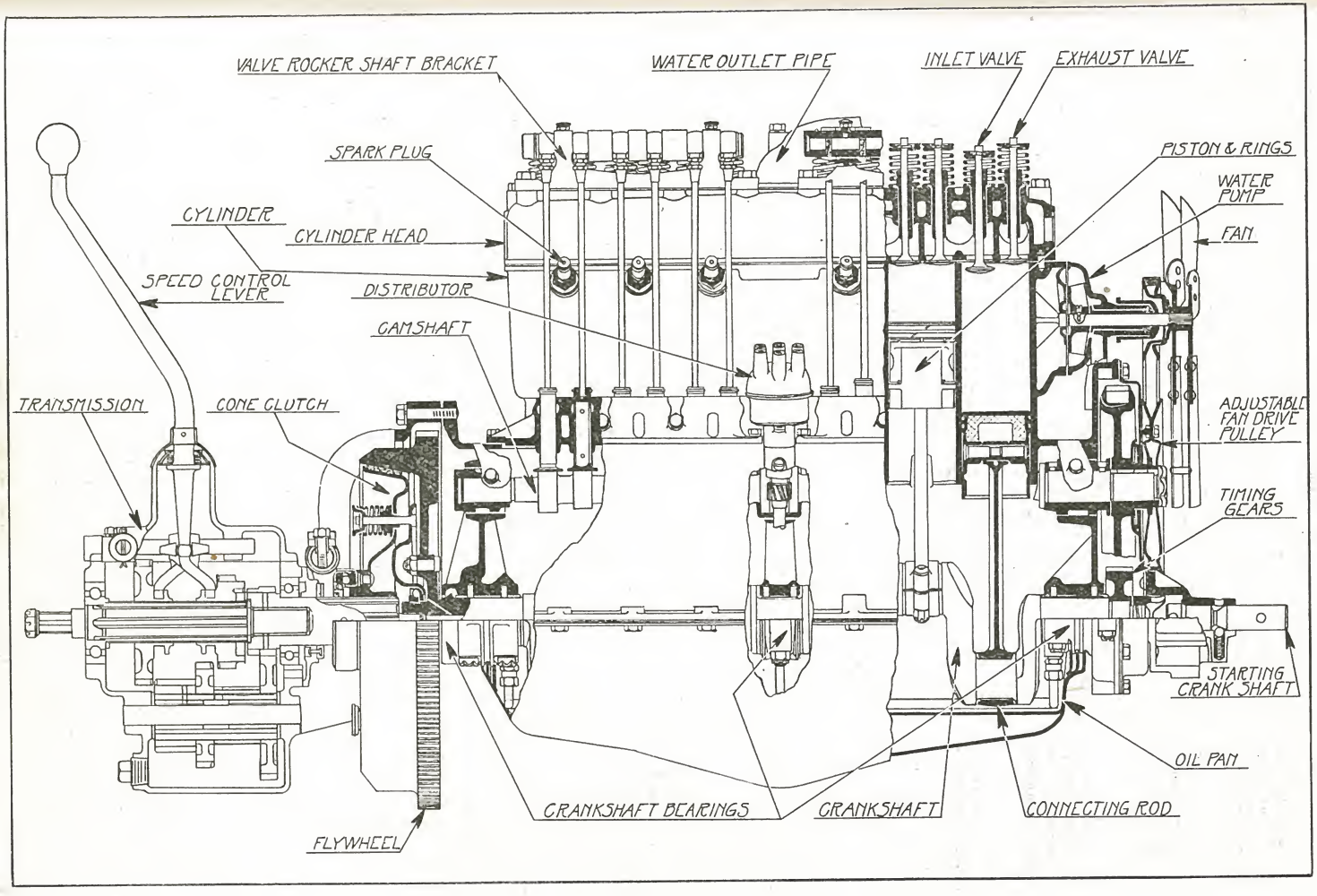


FIGURE 5
Sectional View of Engine

Lower End of Connecting Rod

The lower end of connecting rod is fastened to the crank shaft by two bolts, which also hold the connecting rod, cap and adjusting shims in place.

Adjustment of Connecting Rod

Any wear between connecting rod and crankshaft is taken up by removing a couple of shims of equal thickness from between connecting rod and cap. This operation should be performed by an experienced mechanic, as the fit between these parts must be as perfect as possible.

Three Bearing Crankshaft

The crankshaft is supported by three bearings, each bearing being split, the whole being held in place by studs and nuts.

The adjustment of crankshaft, though more complicated, is similar to the adjustment of the connection rods, and should be taken care of by a skilled mechanic.

Camshaft

The camshaft, located on right side of engine, times the action of the inlet and exhaust valves of the different cylinders. It is supported by three non-adjustable bearings which are held in place by three screws. Beyond the wear of camshaft bearings this assembly requires no attention. The bearings receive their lubrication by spray of oil from connecting rods.

Should it ever be necessary to remove camshaft from engine care must be taken to reassemble camshaft gear properly with relation to crankshaft gear. See remarks on timing gears.

Timing Gears

There are three timing gears in front of engine to time the action between crankshaft, camshaft and electric generator. These gears require no attention. They are lubricated by oil thrown off from the front bearing.

Should it ever become necessary to remove any of the timing gears extreme care must be taken to reassemble the gears properly with relation to each other. To reassemble see Figure 6 for setting of timing gears.

Flywheel

The flywheel is located at rear of engine, being bolted to crankshaft and requires no attention.

The flywheel can be used in setting the inlet and exhaust valves by using marks on rim.

It will be noted that in the timing diagram the inlet or exhaust valves of two cylinders are together. This is due to the crank shaft making two revolutions to one of the cam shaft.

With starting crank in position, turn flywheel until mark "U. D. C. 1-6" meaning upper center of cranks 1 and 6, are directly up causing piston 1 and 6 to be up, then by referring to Figure 7, timing diagram, the timing of the different valves will be found.

As an example, to time inlet valves of cylinders 1 and 6 with mark "U. D. C. 1-6" on top, turn flywheel 17½° or $2\frac{3}{32}$" to mark I. O. 1-6 when inlet valve of cylinder 1 or 6 should open; continue to turn flywheel 200½° to mark I. C. 1-6, when inlet valve of cylinder 1 or 6 should close. At this point there should be a clearance of .003" to .004" between valve rocker arms and end of valve stems, indicating that the valves are seated and tight. By referring to timing diagram it will be noticed that exhaust valves of cylinders 3 or 4 open at same time that inlet valves of cylinders 1 or 6 open, and by turning flywheel 230 degrees that exhaust valves of cylinders 3 or 4 close. The clearance between all valve stems and rocker arms when valves are closed should be .003 to .004".

Inlet and Exhaust Valves

The inlet and exhaust valves are located in the top of cylinder head. The only attention required by valves is to see that they are lubricated (see lubrication schedule); that there is a clearance of .003 to .004" between valve lifter arm and valve stems (see timing valves), and that they seat properly and do not allow compression to leak out of cylinders, causing a loss of power in engine.

Grinding Valves

It may be advisable after engine has run 1,500 to 2,000 miles to have valves reground, and in this case an experienced mechanic should be engaged to do the work.

To regrind valves it is necessary to remove cylinder head and then remove valve springs and washers. Secure some very fine emery and oil and mix the two together, or prepared grinding compound.

Lift one valve at a time and place grinding compound on valve seat in cylinder head and then with a valve brace grind the valve

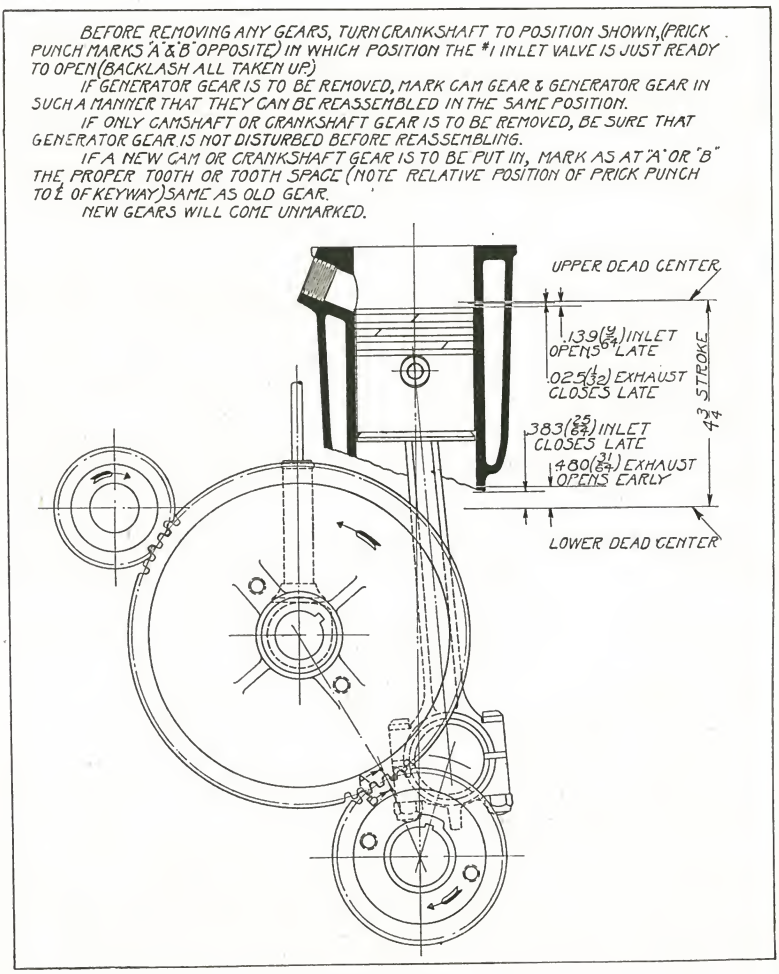


FIGURE 6
Setting of Timing Gears

and valve seat until they fit each other. Be very careful to prevent grinding compound from getting onto valve stem, which would make hole on valve stem guide too large and cause trouble by not allowing valve to seat properly.

Testing Valve for Seating

If it is noticed that compression of a cylinder is weak, examine inlet and exhaust valve springs. See that rocker arm is up and test by passing piece of stiff paper between valve stem and rocker.

Removing Carbon Deposits

It is advisable occasionally to remove spark plugs and pour a few drops of kerosene oil into the cylinders. This cuts and softens any carbon deposits on piston head and walls of cylinders, and after engine has stood without running for some time and it is started again the loose carbon will be blown out of cylinders through exhaust valve.

All lubricating oils and gasoline contain a certain amount of carbon, and if carbon is allowed to accumulate in cylinders it is sure to cause trouble due to lack of compression on account of piston rings sticking, short circuit of spark plugs due to carbon on electrodes of plugs and pre-ignition due to hot condition of carbon deposits.

Even though kerosene oil is used, cylinder head should be removed at least once a season and all carbon deposits scraped out of cylinders.

THE LUBRICATING SYSTEM

(See Figure 8)

Type of Oiling System

The lubricating system of the McLaughlin E-63 engine is known as the force feed type.

Putting Oil into Engine Oil Level Indicator

Oil is poured into crankcase through opening on left side at front of engine into oil pan up to a fixed level indicated by oil level indicator on right side at middle of engine.

The oil pump comprises two gears which mesh with each other in a housing. One of these gears is driven by a shaft off from the camshaft by means of helical gears. The pump is located near

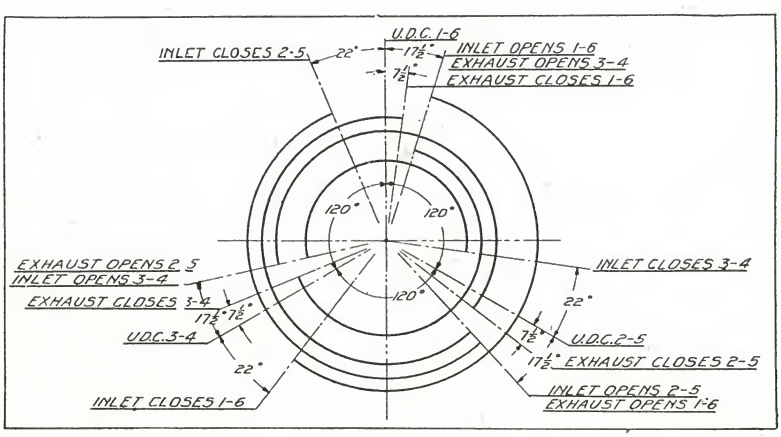


FIGURE 7

Timing Diagram

the bottom of the oil pan on right hand side of motor, below the oil level.

The circulation of oil is given below :

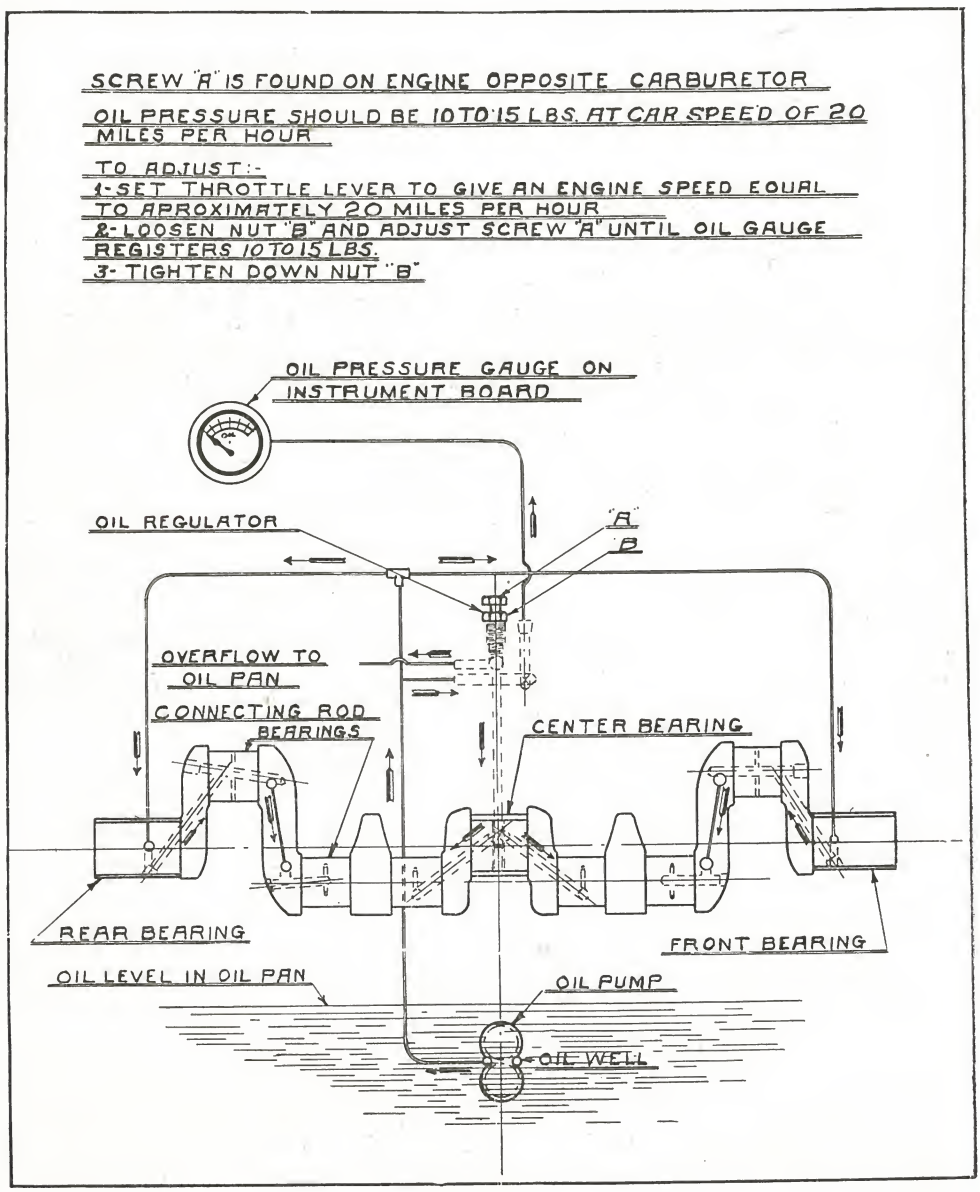


FIGURE 8

Lubricating System

Circulation of Oil

Starting from pump, oil flows into outlet tube and into a tube running the length of the engine. This tube leads oil to the front and rear crankshaft bearings. It also connects with a tube which leads oil into a series of holes drilled in crankcase near the center. One of these holes cconducts oil to center crankshaft bearing; another to the outlet elbow and thence by an oil pipe to pressure indicator on instrument board; another leads to the adjustment chamber and overflow back into the oil pan.

When oil has reached the crankshaft bearings it is forced into grooves in these bearings and through holes drilled in the crankshaft to the connecting rod lower end bearings as shown in Figure 8. The oil thrown off from connecting rod bearings lubricates the camshaft bearings, timing gears, wrist pin bearings and cylinder walls.

Clean Oil Pan Monthly

A fine screen is fitted to the oil pump. This should be washed off in gsaoline whenever oil pan is removed.

It is good practice to remove oil pan occasionally, say every month, and clean out old oil and clean crankshaft, connecting rods, camshaft and cylinder walls with kerosene oil.

To Stop Engine Smoking

In case too much oil is poured into the oil pan it will cause engine to smoke. If oil indicator shows more than full, enough oil should be drained out of bottom of oil pan to bring down to proper level. In a short time smoking will stop.

THE GASOLINE SYSTEM

Units of Gasoline System

The gasoline system consists of gasoline tank, gasoline pipes, vacuum tank, carburetor and intake manifold.

Gasoline Tank

The gasoline tank is carried at rear of car. In the top of tank are located the filler cap and gasoline gauge. Beyond seeing that gasoline straps are kept tight this unit requires no attention.

The capacity of gasoline tank is 10 gallons. When filling the gasoline tank use a piece of chamois to strain gasoline and thus prevent any water and foreign particles from entering the tank.

The gasoline lines consist of two ¼ inch pipes, one leading from bottom of gasoline tank to top of vacuum tank and one from bottom of vacuum tank to the bottom of carburetor. Beyond keeping gasoline connections tight these pipes require no attention.

Vacuum Gasoline Tank

The vacuum gasoline tank is located on right front side of dash under hood. This tank is connected by pipes to intake manifold, gasoline tank and carburetor.

Function of Vacuum Gasoline Tank

The function of this tank is to draw the gasoline from gasoline tank to vacuum tank and as a carburetor requires it the gasoline is fed from vacuum tank to carburetor.

For complete instructions on care and adjustment of vacuum tank see Stewart-Warner Speedometer Corporation's Vacuum Tank Instruction Book.

Address all inquiries for information and service to the nearest Service Station or Branch of the Stewart-Warner Speedometer Corporation, 1826-1852 Diversey Boulevard, Chicago, Illinois.

The Carburetor

The carburetor is located on the left side of engine and serves the purpose of mixing air and gasoline in such a manner that a high explosive gas is formed and later ignited in the various engine cylinders.

Carburetor Control

The amount of gas issuing from carburetor to engine determines the speed of the engine, and is controlled by throttle lever on top of steering gear and accelerator pedal in toe board.

Cold Weather Starting

Choker Control

For cold weather driving and quick starting the carburetor is fitted with a hot air tube and choker control. The hot air tube serves to conduct hot Exhaust gas from the Manifold to the carburetor jacket. After engine has run for some time, this air pre-heats the gas in carburetor which causes better combustion in engine cylinders. The choker control operates from instrument board, by pulling up, causing outside supply of air to be cut off from carburetor; this allows pistons to draw clear gasoline into cylinders, eliminating the necessity of priming before starting engine.

After engine starts, gradually press choker back into place to permit proper mixture of gasoline and air in carburetor. Never leave choker button entirely pulled out, as it will cause engine to load up with gas and cause it to stop.

Adjusting Carburetor

To adjust carburetor, start engine and set throttle for engine to run at moderate speed, which means nearly closed. Turn needle valve a trifle at a time until engine runs smoothly, allowing engine to run until thoroughly warmed up before making final adjustments. (See Figure 9.)

Final Adjustment

Carburetor Popping Noise

To get final adjustments turn air valve screw to the left, releasing air valve spring, until engine begins to slow down. This indicates that air valve spring is a trifle too loose; turn air valve screw to right about ⅛ turn at a time until engine runs smooth. Advance spark lever on top of steering gear about ½ of its entire travel. Open throttle quickly and as far as possible; upon doing this engine should speed up promptly and quickly. If engine hesitates or a popping noise in carburetor is heard turn needle valve a trifle to the left, to admit more gasoline, and again open throttle. Continue this adjustment until carburetor stops popping when engine should run smoothly at all speeds. The air valve screw should be adjusted so that end of screw is about even with ratchet set spring. The needle valve should have a final adjustment of from ⅝ to ⅞ of a turn.

Final Position of Air and Needle Valves

Final Setting of Spark Lever

For final setting of spark lever see instructions for the electric system; the average final setting is about full advance.

Highest Gasoline Economy

The highest economy of gasoline is obtained by adjusting air screw to the left and needle valve to the right as nearly as possible to obtain the desired results.

Carburetor Set Screw

The set screws on the side of carburetor act as stops for throttle lever. If engine runs too fast when idling, back up set screw to close throttle and vice versa if engine runs twoo slow.

Heat Control

The carburetor has a manually operated heat control of hot gas from the exhaust manifold. This hot gas is led into the intake manifold jacket and forced around throttle in a hot air jacket. The heat keeps the gas and air in the gas chamber sufficiently warm to insure perfect combustion in cylinders at all speeds of the engine, and is accomplished by having a large quantity of heat in the jacket when throttle is nearly closed and gradually dimnishes as throttle opens.

The heat should be regulated so that hot air jacket is not too hot to the touch of your hand.

Adjustment of Heat Control

The adjustment of the heat is accomplished by the setting of a damper in the intake manifold directly above carburetor.

Intake Manifold

The intake manifold serves to support carburetor and distribute the gas from the carburetor to the various cylinders; it also serves to draw air from vacuum gasoline tank, thereby creating the vacuum which sucks gasoline from gasoline tank. Beyond seeing that all

joints are kept perfectly tight the intake manifold requires no attention.

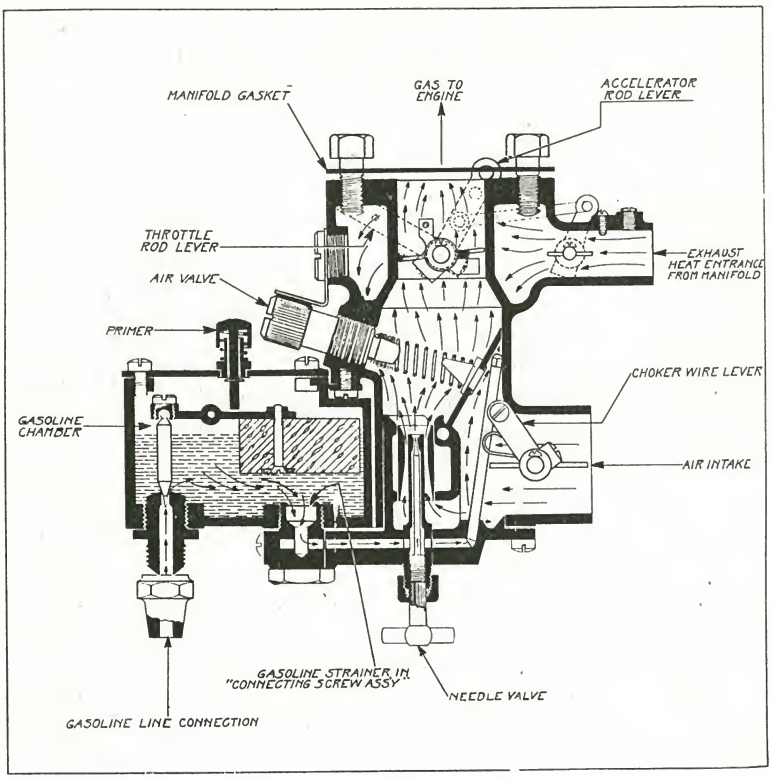


FIGURE 9

Sectional View of Carburetor

THE IGNITION SYSTEM

(See Figure 10).

The Electrical System

For a complete explanation of the ignition system refer to the McLaughlin Remy Instruction Book, and the Exide Manual on Storage Battery. These books cover the operation and maintenance of the Starting Motor, Starting Switch, Generator, Spark Plugs, ignition Coil, Condenser, Resistance unit, Combination Switch, Storage Battery and all wiring.

Remy Electrical Equipment Guaranty

The following is the Remy Electric Company's Warranty, covering the starting, lighting and ignition systems of the McLaughlin Light Six.

The Remy Guarantee

We guarantee the Electrical Equipment furnished by us for one year, this warranty being limited to the furnishing at our factory or service station of such part or parts of Electrical Equipment as shall under normal use and service, appear to us to have been defective, in material or workmanship.

The conditions of this warranty provide that the part or parts claimed to be defective shall be returned to our factory or service branch, transportation charges prepaid.

The condition of this warranty is such that if the Electrical Equipment to which it applies is altered or repaired outside of our factory or service branch that our liability under this warranty shall cease.

The purchaser understands and agrees that no warranty of the Electrical Equipment is made or authorized to be made by us, other than that hereinafter set forth.

REMY ELECTRIC COMPANY

STORAGE BATTERY

The storage battery used with the McLaughlin-Remy electric starting, lighting and ignition system is known as the 'Exide type 3-XC-13-1" and is manufactured by the Electric Storage Battery Company of Philadelphia, Pa., by whom it is guaranteed as follows :

Battery Guarantee

"We guarantee the 'Exide' automobile starting and lighting battery in this car for a period of six months from the date of manufacture, which date is stamped on the battery name plate."

"On delivery at our factory, Philadelphia, Pa., or at any 'Exide' Battery Depot, within six (6) months from date of manufacture, and transportation charges prepaid, we will replace, if defective or incapable of giving its rated capacity for any other reason than lack of charge."

Battery Service

The Electric Storage Battery Company maintain "Exide" Battery Depots which carry a complete stock of batteries and battery repairs, and which are fully equipped to do any kind of battery repair work, at all branches of the Canadian General Electric Company.

Batteries, like tires, wear out. They will last longer, however, if they receive proper care, which can be done in the following manner :

Adding Distilled Water Important

1. Constant charging and discharging of a battery causes the water in the solution (electrolyte) to evaporate and in order that the plates may not be exposed to the air, distilled water must be added every week in the summer and every two weeks in the winter. The proper height of solution is about ⅜ inch above the plates. Do not completely fill the cells; there must be room left for expansion.

All Cells Must be Tested Regularly

2. Keep the battery fully charged. You can determine whether you are doing this by testing the solution every week with a hydrometer. If you are not running your car fast or far enough to accomplish this, the battery must be recharged from an outside source, or else it will deteriorate.

Free Service

Any Exide Factory Branch or Service Station will save you the trouble of adding distilled water and testing the battery, without charge, not only once a month, but any time you ask them.

Replacing Old Batteries with New Ones

Remember—batteries are similar to tires in this respect; they must be taken care of, and even then they will wear out. Make yours last as long as possible by giving it the proper attention, and when it does wear out bring it to us and we will take in your old one and sell you a new one at a special price.

New Cars Free Replacement of Broken or Leaky Jars

It sometimes happens that batteries that are shipped to automobile factories (and in turn shipped with their cars to their distributors or dealers), receive rough handling in transit, and reach the user with a broken or leaky jar. The user is entitled to a perfect battery and as it is difficult to determine who is at fault we will gladly replace, at any of our Factory Branches, or at any Exide Service Station, located outside of cities where we maintain branches, any jar which has been damaged in this way, making no charge for labor or material; provided, that claim is made within six (6) months after battery has left our factory. Transportation charges must be prepaid.

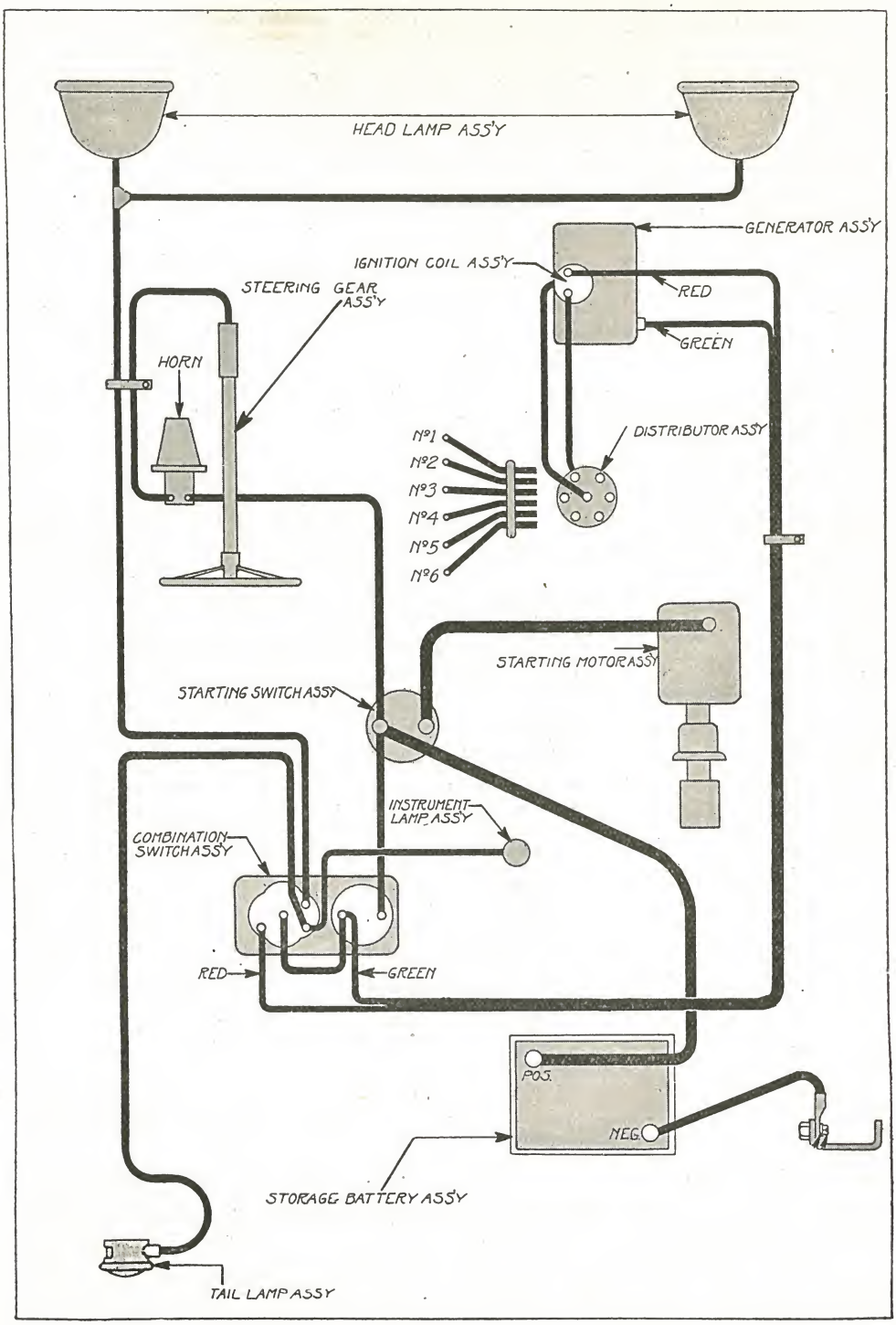


FIGURE 10
Wiring Diagram

In connection with the foregoing, Figure 10 in this book shows the wiring diagram which indicates positions of all electrical units and wires. When replacing lamp bulbs specify as follows :

Head Lamp Bulb, 6-7 volts, 15 candlepower, single contact; Tail Lamp Bulb, 6-7 volts, 2 candlepower, single contact; Instrument Lamp Bulb, 6-7 volts, 2 candlepower, single contact.

THE WATER CIRCULATING SYSTEM

(See Figure 11)

Type of Systems

Circulating of Water

The water circulating system of the McLaughlin Light Six is of the centrifugal pump type. Cool water is pumped from the bottom of the radiator to the pump and is then forced around the cylinder and valves through water jackets, after which in a warm state it returns to the radiator where, due to the air radiating tubes, it is again cooled and used over again.

Circulating System Units

This system is comprised of the radiator, radiator fan, fan belt, fan drive pulley, water pump and two hose connections.

The Radiator

The purpose of the radiator is to keep the water in circulating system at a normal temperature, and to do this very light gauge material has to be used in its construction, therefore, it is advantageous to use clean water at all times and to keep upper tank about two-thirds full when radiator will be at its best efficiency. The cooling element is the core which has a large number of vertical tubes and horizontal fins. Through this core air is drawn by the radiator fan and momentum of the car which cools the hot water as it passes through the tubes from the upper to the lower tank.

Drain Radiator

Precautions for Cold Weather

It is advisable to drain radiator occasionally and flush out all sediment. This can be done by removing radiator cap, inserting a hose and opening drain cock in bottom tank. Be sure to note remarks on "Precautions for Cold Weather," page 23, which explains how to take care of the water circulating system under such conditions.

Boiling Water

Should the water in the radiator tend to boil, any one of the following cases may be the cause and can be adjusted without any special instructions :

Causes of Boiling Water

Not enough water in the radiator;
Retarded spark control lever;
Loose fan belt;
Broken fan;
Water pump impellor loose on shaft;
Water system stopped up;
Emergency brakes set up tight;
Tight bearings in engine, transmission or axles, due to lack of lubricant;
Gasoline mixture too rich;
Dirty water;
Obstructed passage of air through radiator core.

Keep Radiator Fastened Tight and Clean Inside

Examine bolts, nuts and lockwashers which hold radiator in place, occasionally, and see that they are tight. This may prevent serious injury to radiator.

It will be noticed that the operation of the radiator is dependent almost on outside conditions so that very little attention need be given to the radiator itself beyond keeping it tight on frame and clean inside.

Radiator Fan Efficiency of Fan

Fan Mounting

The radiator fan is of the three-bladed double type. It increases the radiator efficiency by creating a draft of air which it draws through the radiator core to keep water at a uniform temperature when car is in motion or standing still. This fan is mounted on the end of water pump shaft and beyond seeing that it is in motion when engine is running it requires no further attention.

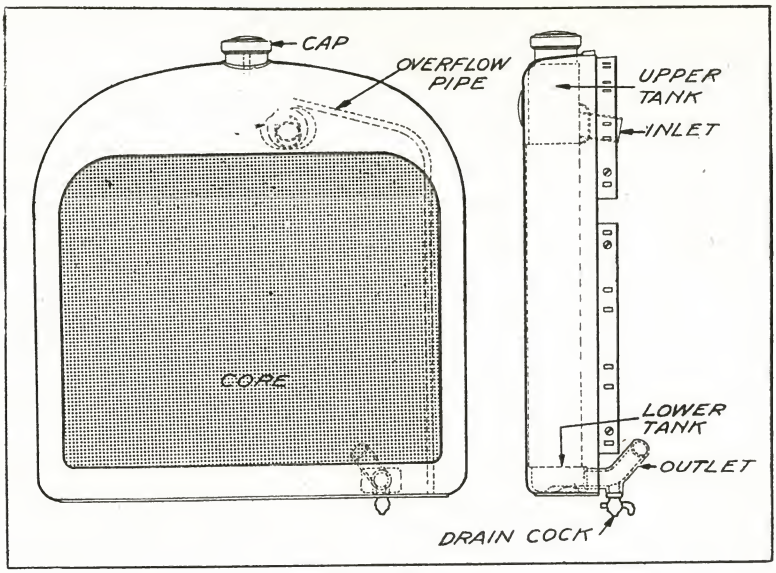


FIGURE 11
Radiator

Fan Belt

The fan belt serves to drive the water pump and radiator fan and requires no attention aside from being kept fairly tight.

Fan Drive Pulley

The fan drive pulley is mounted on the end of the camshaft and serves to drive the water pump and fan. The pulley can be adjusted to take up any slack in fan belt.

Pulley Diameter Adjustments

The "V" type of groove in pulley can either be decreased or increased in size, to loosen or tighten fan belt, by loosening the three cap screws in pulley and turning front half of pulley to right or left. To increase diameter of pulley turn front half of pulley to the left and vice versa to decrease diameter.

Water Pump Pump Shaft and Bearing Pump Impeller

The water pump is located in the front of engine and serves to circulate the water through water circulating system. The pump shaft is mounted on a non-adjustable self-lubricating bearing which require no attention. The pump impeller is mounted on pump shaft and is held in place by a set screw.

Sectional view of water pump, fan and drive pulley is shown very clearly in figure 12.

Pump Body

The pump body is comprised of two halves which are fastened to front of engine by studs and nuts. Beyond keeping nuts tight the body requires no attention.

Packing Nut

A packing nut is located on front end of water pump front bearing and should be kept just tight enough to prevent water from leaking out around pump shaft. Be careful not to have packing nut too tight, as it might cause water pump and fan to stop when engine is running and prevent water from circulating. The water pump packing should be renewed only when it w ll not hold water.

Tight Packing Nut

Pump Packing

Hose Connections

The two hose connections which connect radiator and engine should be kept securely clamped in place to prevent leakage of water and require no other attention.

THE EXHAUST SYSTEM

The exhaust system is comprised of the exhaust manifold, exhaust pipe, and muffler which serve in turn to conduct exhaust gas from the engine and muffle the sound of the explosions.

This system requires no attention.

THE CLUTCH

(See Figure 5)

Clutch

The gasoline engine cannot be started under a load, making it necessary to provide some means of applying the load after the engine has been started and has reached its normal speed. In automobiles this is accomplished by what is known as the clutch. The McLaughlin E-63 is provided with a leather faced cone clutch operating against a conical surface in the fly-wheel and controlled by the clutch pedal in the driver's compartment.

Clutch Facing

Clutch Springs

The clutch consists of a steel cone, the outer face of which is tapered and faced with leather. Small springs placed around the face of the cone press the leather out slightly at these points. Four coil springs force the clutch into contact with the fly-wheel.

Clutch Control

Around the clutch hub a ball bearing is fitted which is connected to both the clutch and actuating fork or lever. This whole assembly is controlled by the clutch pedal.

Clutch Control

The clutch is always engaged with the fly-wheel unless the clutch pedal is pressed down which causes the clutch springs to compress and release the contact between the fly-wheel and the clutch. In this condition the engine is free to run without moving car.

Transmission of Power

When in full engagement the clutch and fly-wheel turn as a unit, the clutch transmitting the engine power through the change gears and so on to the rear axle and rear wheels.

Slipping of Clutch

When the engine is picking up the load in starting the car the clutch will slip a trifle before taking hold. However, under all other conditions of driving, slipping of the clutch should be avoided, as this causes the leather facing to wear unnecessarily.

Foot off Clutch Pedal

Except when driving in crowded traffic or manoeuvring car in close quarters it is best to keep your foot off the clutch pedal, as this has a tendency to slip the clutch.

Learn to operate the car with the throttle lever and accelerator and keep your foot near the clutch pedal where pedal can be reached instantly, if necessary.

Clutch Inspection

Inspection of clutch may be made through an opening in the housing of clutch immediately behind the fly-wheel.

Don't Lubricate

Caution : Do not put oil or grease in the clutch housing as there is nothing for it to lubricate, and if this should happen it will cause the clutch to slip.

To Stop Clutch Slipping

If oil or grease should get on the clutch leather facing and cause clutch to slip, apply some finely ground Fuller's Earth to Leather facing.

Helping Clutch to Hold

Should clutch leather facing become hard and dry, a few drops of Neatsfoot Oil applied at frequent intervals will cause the leather to soften and make it hold better.

No Adjustments

No adjustments of the clutch are necessary.

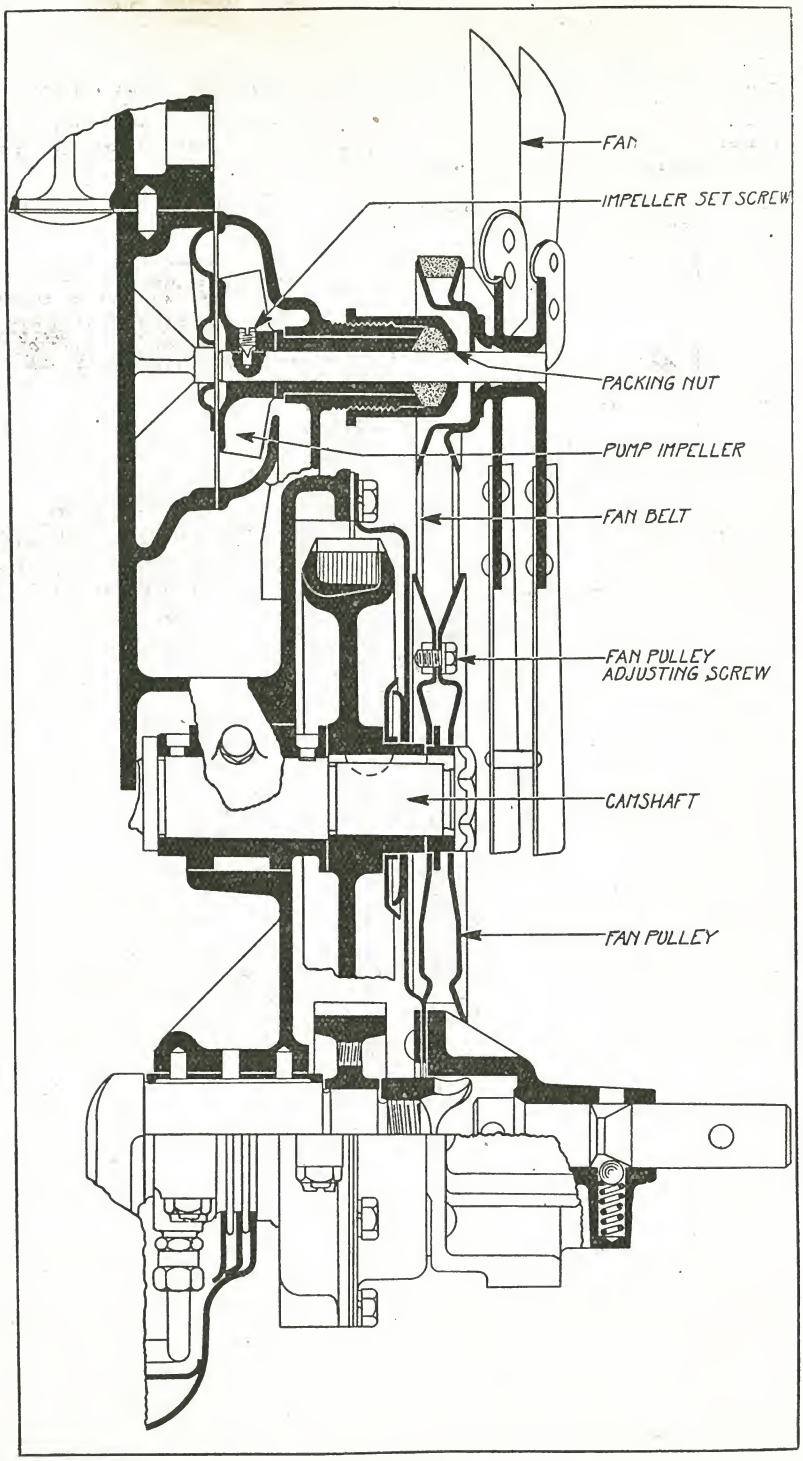


FIGURE 12
Sectional View of Water Pump, Fan and Drive Pulley

Clutch Pedal Adjustments

The position of the clutch pedal is adjusted by a "V" shaped nut on a rod in the left of the transmission. (See Figure 13.)

To Make Repairs

When making repairs to any of the clutch parts it will be necessary to disconnect the transmission from engine and propeller shaft and remove from the car.

The clutch requires no attention other than that previously referred to.

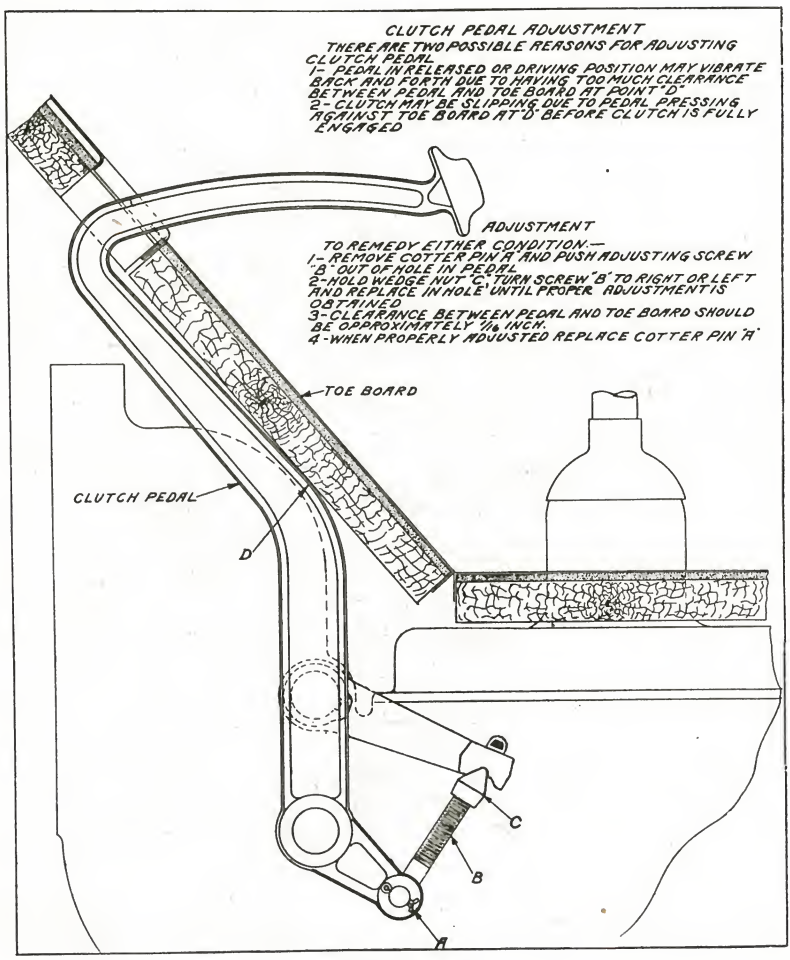


FIGURE 13
Clutch Pedal Adjustment

TRANSMISSION
(See Figure 14)

The Engine and Transmission

The transmission is made necessary by the peculiarity of the gasoline engine. The power developed by a gasoline engine is almost directly proportionate to the engine speed. In other words, if a given engine develops 10 horsepower at 500 revolutions per minute, it will develop approximately 20 horsepower at 1,000 revolutions per minute. Hence the higher the speed the greater the power, within certain limits.

Engine Power and Car Speed

On the other hand the car frequently requires the most power when it is moving slowest, as when pulling up a steep hill or through sand or mud. At such times the requirements of the car for power to be delivered at a low rate of speed are directly opposed to those of the engine which will deliver more power only at a higher speed.

Change Speed Gears

It is the transmission change speed gears which overcome this apparent difficulty by changing the ratio between the speed of the engine and the speed of the rear wheels.

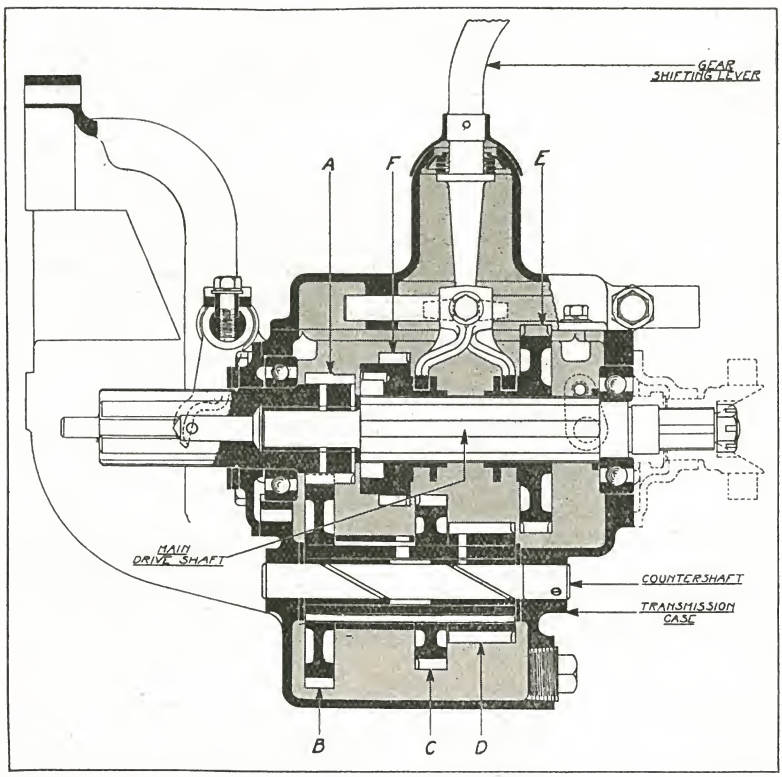


FIGURE 14

Sctional View of Transmission

Type of Transmission

The McLaughlin Light Six is equipped with a selective sliding type transmission mounted as a unit with the engine. It consists essentially of two shafts mounted one above the other in an oil-tight casing, as shown in Figure 14. On the lower or countershaft, are three gears of different sizes, "B," "C" and "D," all of which revolve together. The upper shaft is divided between gears "F" and "A" and these two gears are free to turn independently of each other. The rear "A" connects at its forward end to the clutch and the shaft on which gears "F" and "E" slide is connected in the rear to the propeller shaft. Gears "F" and "E" are fitted to the splined part of this shaft and have grooves in their hubs to receive the shifter forks by which they are moved back and forth along the shaft. At one side of the lower shaft is mounted two gears, "G" and "H," not shown in cut, one of which is constantly in mesh with gear "D" on the lower shaft.

Transmission Units

Neutral Position

As shown in Figure 14, the sliding gears "F" and "E" are in neutral positions, meaning that neither of these gears are in mesh with any other gear. When the clutch is engaged with fly-wheel, gear "A" turns with the engine. Gear "A" and "B" are always in mesh, and are known as fixed reduction gears. Since all the gears on the lower shaft are connected to gear "B" they all turn as a unit.

To cause the engine to turn the rear wheels and start car it is necessary to shift the gears into operation as follows :

First Speed Position

When the gear shift lever is moving to first speed, gear "E" moves forward until it is meshed with gear "D." Now the power of the engine is transmitted through gear "A," "B," "D" and "E" to the propeller shaft, rear axle and rear wheels, and both gears "A" and "E" turn in same direction, though at different speeds.

Second Speed Position

As the car gains speed, less power is required to drive it; the gear shift lever is moved to the second speed position and gear "E" is moved back out of mesh with gear "D" to position shown in Figure 14, and gear "F" is moved backward into mesh with gear "C." The power is now transmitted through gears "A," "B," "C" and "F."

Third Speed Position or Direct Drive

Gear "F" is provided with internal teeth cut on its front face and when car has gained sufficient headway the gear shift lever is moved to third speed position and gear "F" moved out of mesh with gear "C" and slips into mesh with gear "A." This locks the two parts of the upper shaft solidly together and both turn to the right at the same speed, transmitting the engine power direct through propeller shaft and rear axle to the rear wheels. The gears on the countershaft continue to turn but without doing any work. In this position the transmission is said to be on direct drive and the engine crank shaft turns 4½ times for each revolution of the rear wheels, which is the standard gear ratio or reduction of the rear axle.

Gear Ratio

Reverse Speed

To reverse the motion of the car the gears are all set back to neutral and gear "E" is moved back to mesh with gear "H," which is already meshed with gear "D" and "G.". Power is now transmitted through gears "A," "B," "D," "G," "H" and "E" in the order named. Gear "A" revolves to the right, gear "B" and "D" to the left, gears "G" and "H" to the right and gear "E" to the left, thus reversing the motion of the propeller shaft.

Alloy Steel Gears

The transmitting gears are made of unusually strong alloy steel which have short, strong teeth. The teeth are beveled on the edge to make them move into mesh with each other more easily,

Care in Shifting Gears

but care must be taken to always release the clutch before shifting gears "F" and "E" to prevent the rapidly moving edges of teeth from grinding against each other before they move into mesh.

Position of Gear Shift Lever

As already noted the gear shift lever controls the movement of gears "F" and "E." For further reference to gear shift lever positions, see Figure 2.

Attention of Transmission

Beyond lubrication, the bearing shaft, gear shifter rods and gear shift lever require no attention.

Repairs

To make any repairs to speed shift lever and shifter rods the upper part of transmission can be moved by taking out several cap screws. However to make any repairs to lower part of transmission it will be necessary to disconnect the transmission case from the engine and propeller shaft.

Lubrication

The lower part of the transmission case is always kept filled with lubricant and the gears on the countershaft, which runs in it all the time, distributes it on the other gears and bearings. The amount of lubricant necessary can be determined by lubricant level

plug on left side of transmission case. The lubricant can be removed by removing pipe plug in the rear of transmission case.

For further information on lubrication, see General Lubrication and Figure 4, Lubrication Chart.

UNIVERSAL JOINTS AND PROPELLER SHAFT

(See Figure 15)

Use of Joints and Shaft

Universal joints and propeller shaft are used to connect and distribute power from the engine and transmission to the rear axle and road wheels.

Description of Joints and Shaft

The Universal joints and propeller shaft of the McLaughlin E-63 consists of one universal joint fastened to the rear end of the transmission shaft. Sliding in the rear end of this joint is the propeller shaft and to the rear of the propeller shaft is another universal joint which is fastened to the front end of the rear axle drive pinion shaft.

Attention to Joints and Shaft

The universal joints in connection with the spline-ended propeller shaft serve to compensate for the inequalities in the positions of the fixed transmission and the moveable rear axle. Some attention should be given to the universal joints to see that they are securely fastened at both ends of the propeller shaft to the hubs which are fastened to the shafts of the transmission and rear axle.

Lubrication

The universal joints and spline portion of front joints should receive lubrication. For reference to lubrication, see Figure 4, and lubrication schedule. Aside from the above remarks the universal joints and propeller shaft require no attention.

Removing Joints and Shaft

To remove universal joints and propeller shaft to make any repairs it is only necessary to remove the bolts in the front and rear universal joints, when the entire assembly can be removed from the car.

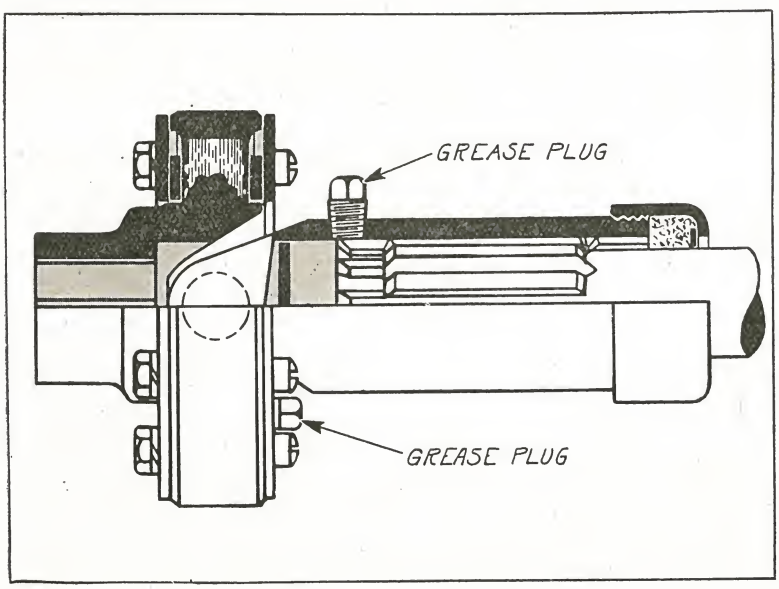


FIGURE 15
Universal Joint and Propeller Shaft

REAR AXLE

(See Figure 16)

Use of Rear Axle

The rear axle serves to transmit power from universal joints and propeller shaft to rear wheels, and at the same time forms a support for the rear end of the car.

The rear axle consists essentially of the driving shaft, drive pinion, differential, axle shafts, rear hubs, service and emergency brakes and housings and several bearings, upon which the movable parts are mounted.

Third Member Unit

The drive pinion shaft is mounted in two ball-bearings, the whole being mounted in what is known as the third member housing. This assembly is bolted to the differential housing.

Differential

The differential consists of a ring gear, together with a housing which is split to receive the differential gears, the whole assembly being mounted in two roller bearings, which in turn are supported by the differential housing. Thrust bearings are placed in both ends of differential case to take up thrust between the drive pinion and ring gear.

Reasons for Differential

The differential serves to compensate for difference in distance traveled by one wheel against the other when the car runs in a circle.

Axle Shafts

The axle shafts are fastened to two of the differential gears with castle nuts and at the outer end are fastened to the hubs, each hub being held in place by a key and nut. The nut is prevented from turning by a washer which has a tongue entering key way; also lips, one of which is bent over to hold the nut.

Mounting of Rear Wheel

The rear wheel hub is mounted on one roller bearing which in turn is mounted on the axle tube, thereby causing the full load of rear end of car to come on the axle tube instead of the axle shaft, the result being that the axle shaft serves to drive the wheels and does not carry any other load.

Brake Shaft Brackets

To the outside of axle housing are brackets which support the service and emergency brake shafts.

Service Brake

The service brake, which is used almost entirely and is operated by the foot brake pedal in the driver's compartment, consists of a steel band with a special brake lining. When the pedal is pressed down the bands are contracted against a brake drum on the rear wheel.

The emergency brake is operated by a hand lever in the driver's compartment.

Adjustment of Emergency Brakes

Provision for the adjustment of emergency brakes is taken care of by a "V" shaped nut on front end of front emergency brake rod. See Figures 17 and 18 for further reference to service and emergency brakes.

Adjustment of Driving Pinion

To adjust driving pinion and ring gear loosen lock which holds front bearing sleeve in front end of third member and by turning the bearing sleeve to the right the driving pinion moves toward ring gear, thereby taking up any back lash in the teeth of these two gears; turning bearing sleeve to the left withdraws driving pinion from ring gear, causing back lash to increase or make more clearance between the teeth of these gears. This adjustment can be made without removing rear end universal joint. To remove entire third member assembly it is necessary to disconnect rear universal joint and remove the several nuts and lock washers from studs in the rear axle housing.

Removing Third Member

No adjustments of the differential are required .

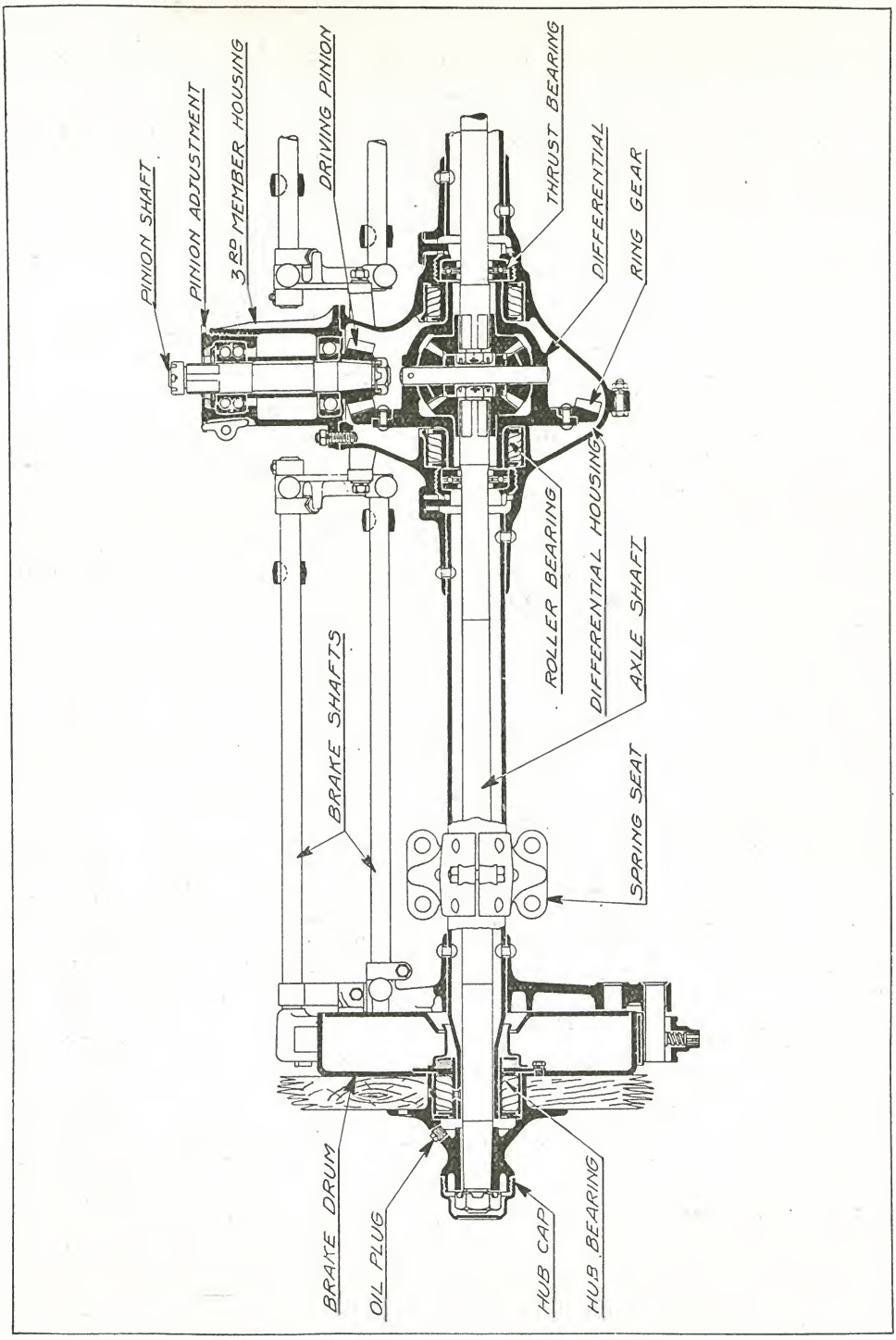


FIGURE 16
Sectional View of Rear Axle

Removing Differential

To remove differential from rear axle housing remove the entire rear axle from the car and disassembly can be taken care of at this point. For reference, see Figure 16.

Reassembling Rear Wheels

To remove either of the rear wheels secure auto jacks and jack up rear end of car so that wheel or wheels clear the ground, secure hub cap wrench from tool kit and remove hub cap; then press back the lip of lock washer and remove axle shaft nut. See that the emergency brake is released and by gripping spokes with both hands the wheel hub should slide off end of axle shaft. The outer end of axle shaft and inside of rear wheel hub are tapered and as noted before the hub is held from turning by a key between hub and axle shaft. When reassembling rear hub on axle shaft secure an oil can and cover the outside of shaft taper with oil and with the end of your finger distribute this oil evenly over this entire surface; this will prevent rear wheel hub from becoming rusted on axle shaft.

Lubrication of Rear Wheels

Lubrication of Rear Axle Parts

A pipe plug is provided in third member of rear axle to permit of lubricating the two bearings of the driving pinion shaft.

A pipe plug is provided which admits of lubricating the differential gears, roller bearings and thrust bearings in rear axle housing.

A pipe plug is provided in the rear wheel hub to permit of lubricating rear wheel roller bearings.

To permit of lubrication of service and emergency brake shafts grease cups are provided.

For further reference to instructions for the lubrication of the rear axle, see Figure 4, and lubrication schedule.

Squeaking Brakes

To prevent service brakes from squeaking when foot brakes pedal is applied, secure an oil can filled with gasoline and rquirt the gasoline on the service brake lining its entire length.

FRONT AXLE

(See Figure 19)

Front Axle Parts

The front axle carries the weight of the forward part of the car and at the same time allows the front wheels to turn in response to the action of the steering gear so that the car may be guided along the road. It consists essentially of a drop forged steel beam with bearings at each end. Steering knucles fit over the bearings and turn on king bolts which hold them in place. The wheels revolve on spindles which form a part of the knuckle and are carried on two rows of ball bearings in each hub. To the knuckle are attached steering arms which are connected together behind the axle by the tie rod. The left hand knuckle has a third arm which ends in a steel ball and this is connected to the drag link, which in turn is connected to the steering gear pitman arm. When the steering wheel is turned the drag link moves ball-ended third arm forward and back, at the same time swinging the steering knuckle spindle and wheel in an arc about the king bolt. As the left wheel swings it acts on the right wheel through the tie rod and compels it to swing in the same direction. On account of the steering arms being set at an angle the two wheels do not swing an equal amount, because the outer one has to travel a slightly larger circle than the inner one. The axle is suspended from the frame by the front springs which are clipped to the spring pads of the axle I-beam.

Action of Front Wheels

Camber and Gather

It will be noticed that the front wheels do not stand quite straight, but that they are closer together at the bottom than at the top, and that they are toed in slightly at the front; the amount of the top divergence from the vertical is known as the "camber" and the amount that toes in as the "gather" of the wheels. The

camber causes the point of road contact to fall more clearly under the center of the king bolt and thus make the car steer easier, while the gather is to offset the effect of the camber and makes the tires wear more evenly.

To get the proper amount of gather the front wheel should measure ⅜ of an inch closer at the front than at the rear. These measurements are between the inner edges of the rims.

Adjustment of Tie Rod

If the tie rod or steering arm should become bent the amount of gather may be adjusted by removing the bolt in the tie rod joint and turning the yoke to the right or left as may be necessary and then replace yoke on steering knuckle together with bolt and nut. (See Figure 19.)

Removing Front Wheels

To remove the wheel unscrew the hub cap, take out cotter pin, unscrew the nut on end of spindle and take off the safety washers. The wheel can then be pulled off.

Adjustment of Bearings

When putting the wheel back on, care must be taken to properly adjust the bearings, the cones should be drawn up by the nut until there is no side play of wheel and at the same time the wheel should revolve freely. This adjustment is very important, as the bearings will be short lived if they are either too tight or too loose.

Lubrication

Grease cups are provided to lubricate king bolts and tie rod. To lubricate wheel bearings it is necessary to remove the wheel and pack bearings in grease.

For further information on lubrication and front axle, see Figure 4 and lubrication schedule.

STEERING GEAR

(See Figure 20)

Semi-Reversible

The steering gear controls the front axle by turning the steering wheel to the right or left. The McLaughlin E-63 steering gear is semi-reversible. It is irreversible as far as shocks are concerned, as the shock of striking a stone or bump in the road will not be transmitted to the steering wheel. You can, however, feel or

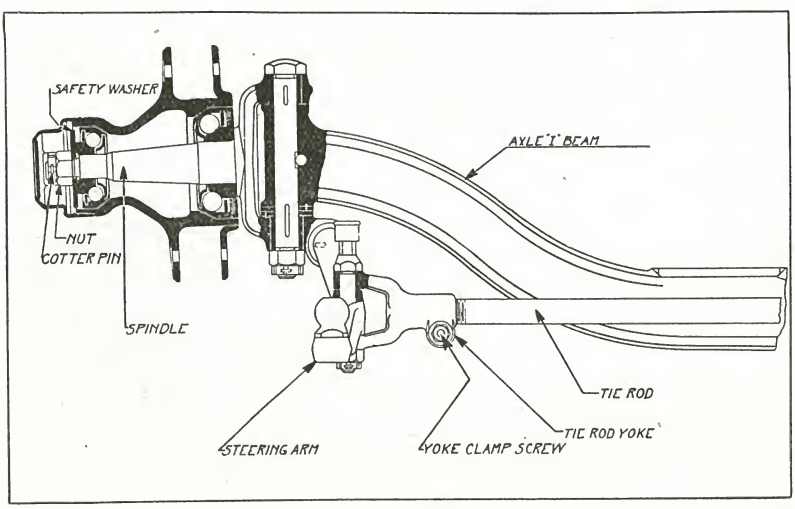


FIGURE 19.
Sectional View of Front Axle Hub

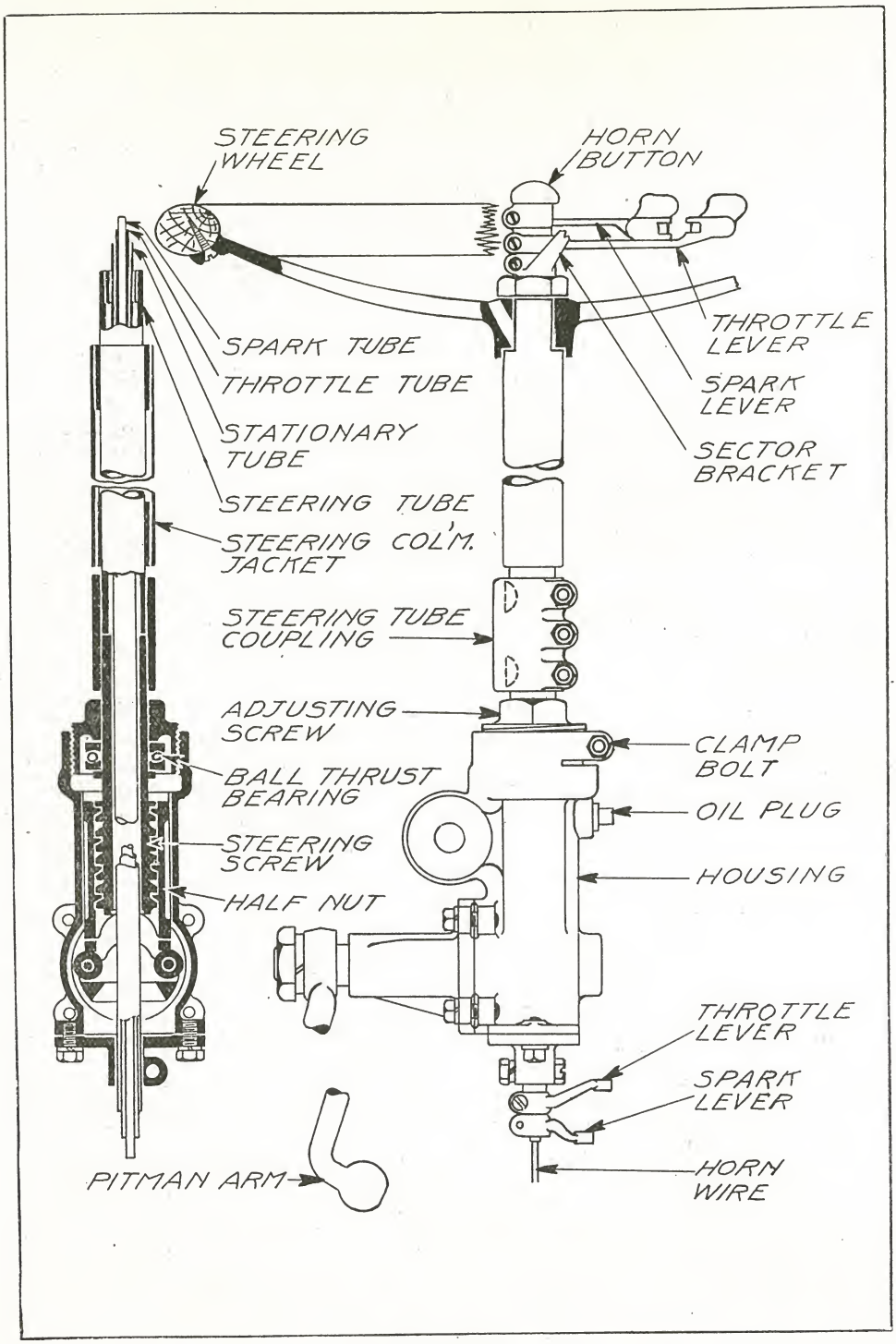


FIGURE 20
Outside and Sectional ViewofSteeringGear

follow your way in ordinary road ruts and gradual turns, this making an ideal condition when driving the car.

Type of Steering Gear

The steering gear is of the double-threaded screw and half-nut type.

Action of Screw and Half-Nuts

The steering gear consists essentially of the steering tube to the upper half of which is attached the steering wheel, while at the lower end of the double threaded screw and half-nuts are located. The double-threaded screws and half-nuts are contained in a housing, one of the half-nuts having a right-hand thread and the other a left-hand thread. The ends of the half-nuts bear against two rollers attached to a yoke on a short shaft which projects outside of the housing, to the end of this shaft a pitman arm is attached, which is connected to the drag link, which in turn is connected to the third arm on the left hand side of the front axle. Turning the steering wheel to right or left also turns the tube end screw in the same direction and as the screw turns, one of the half-nuts rises while the other descends. This pushes one roller down and allows the other to rise, then turning the shaft and imparting the desired motion to the pitman arm and so on to the road wheels.

The Various Tubes

Inside of the steering tube are located a stationary tube, throttle control tube, and spark control tube. Within the spark control tube an electric wire is located which controls the sounding of the electric horn.

Adjustment of Steering Gear

This steering gear is adjusted to all wear by one single adjustment. Excessive back lash or loose motion can be taken up by loosening clamp bolt and screwing down on adjusting screw. (See Figure 20). Care should be taken to see that the gear is not adjusted too tightly. All loose motion apparent in the steering wheel is not always due to the steering gear. The drag link and tie rod should also be examined when making those adjustments. After adjusting steering gear, lock the adjustment nut again with cap screw. Aside from seeing that all the screws, nuts and bolts are securely tightened and too much play in steering wheel is not permitted, the steering gear will require no other attention. A pipe plug is provided in the steering gear house for the lubrication of movable parts within. The several tubes are fitted with small bushings which require only a few drops of oil occasionally; this can be accomplished by dropping oil through oiler which is inserted in the steering wheel.

Lubrication

For further reference to lubrication, see Figure 4 and lubrication schedule.

ROAD SPRINGS

Spring Construction

Road springs are interposed between the front and rear axles and the frame to absorb any shocks before they can be transmitted to the upper mechanism or passengers. These springs consist of thin layers or leaves of steel graduated in length and lying one on top of the other, the longest or master leaf being fastened to the frame by bolts and shackles.

Adaption of Springs and Fastenings

The springs are held down to their seats by spring clips which pass around them near the center of spring, passing through the axle pads and are held in place by nuts and lock washers. A small bolt passes through the spring leaves in the center of axle pads; this bolt holds the leaves from shifting longitudinally. Small clips hold the leaves together near their ends.

Keep Clips Tight

Extreme care should be exercised at all times to see that the spring clip nuts are screwed up tight, as the center of the spring is usually the point of greatest stress and should the spring clip become loose it may cause one or more leaves to break at this point.

Lubrication

The bolts which fasten the springs to the frame are fitted individually with grease cups by which the joints are lubricated and if squeaking develops in spite of this constant lubrication it is desirable to introduce a lubricant between the spring leaves. This is done by jacking up the frame of the car and inserting the lubri-

cant between the leaves after the leaves have been sprung apart by a screw driver or some other mechanical contrivance.

WHEELS

The wheels of the McLaughlin E-63 are of the standard artillery type in which the spokes all meet in the center and are bolted between the flanges of steel hubs. On the outer rim or felloe is shrunk a steel band, known as the felloe band which forms the foundation for the demountable rim. Beyond keeping the wheels clean and free from mud and oil they require no other attention.

RIMS

(See Figures 21 and 22)

Type of Rim

The McLaughlin E-63 is equipped with Perlman bolted-on type of demountable rim, which may be removed from the wheel. The rim consists of a split steel band flanged to fit the base of the tire, which is slipped on over the steel felloe band and held by several bolts and nuts and taper wedges located at equal intervals about the circumference of the wheel.

Advantage

The advantage of this arrangement is that a punctured tire may be removed, rim and all, and replaced with a fully inflated one already attached to its rim without pumping or removing the tire from the rim.

To Remove Rim

To remove the rim, jack up the car and with rim wrench provided for this purpose unscrew all of the nuts and loosen the wedges, after which, use a wrench or pair of pliers to remove the cap which covers the tire valve stem. Turn wheel until the valve stem is on top and by adjusting wedges so as not to interfere with demountable rim, pull the rim from the wheel at the bottom first, and lift the tire and rim to clear valve stem when the tire and rim will be free from the wheel.

To Replace Rim

To replace rim and tire reverse the foregoing instructions and be sure to securely tighten the nuts and wedges which hold the tire and rim in place.

To Remove Tire from Rim

To remove tire from rim, first lay rim and tire flat on the ground and with hammer loosen the locking plate as shown in illustration, see No. 1 (Figure 21).

Then beginning at the end of rim farthest from the valve stem, pry rim off from tire with a screw driver, see No. 2 (Figure 21), and continue this every few inches until the rim easily slips out of tire.

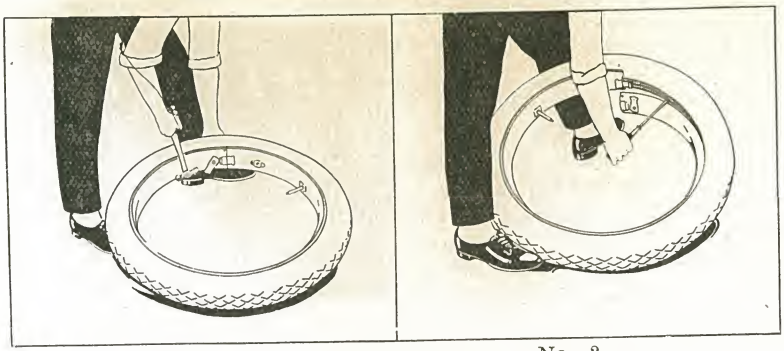
To Replace Tire on Rim

To replace tire on rim, first sprinkle some talc in tire casing to prevent tube sticking, and with tube slightly inflated press into casing evenly all around. Be sure rim is unlocked. Place rim flat on the ground with locking plate pointing up. Raise rim at point where it is drilled to take the tire valve stem, and put valve stem from tire through this hole and fit tire casing onto rim as far around the rim as possible, see No. 3 (Figure 22).

Then lay the tire and rim flat on the ground and hook the upper edge of the free end of rim inside groove in lower edge of the end already fitted on the tire.

Begin at the point where tire fits into the rim and with screw driver pry casing over edge of rim, at the same time pressing tire into place with foot as shown in illustration, see No. 4 (Figure 22).

Continue this until tire completely slips into rim and with hammer tap locking plate back into place. Tire may be inflated and placed on wheel or on tire carrier.



No. 1 No. 2

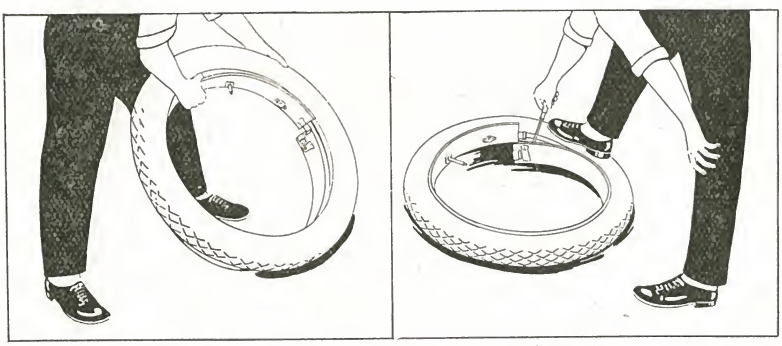
FIGURE 21

Removing Tire from Rim

CAR BODY

The body is the passenger carrying part of the car and consists of a steel shell into which are fitted the seats and cushions. It is bolted to the frame and may be removed entirely without disturbing any of the mechanism of the chassis.

There are no moving parts attached to the body and it will require no attention or adjustment beyond an occasional inspection to make sure all bolts are tight and in good order. This is important.



No. 3 No. 4

FIGURE 22

Replacing Tire on Rim

THE TOP

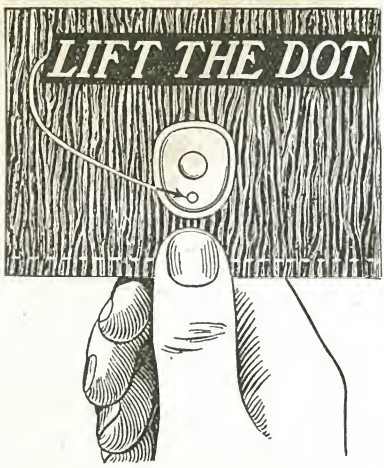
Dry Before Folding

Always leave the top up until it gets thoroughly dry before attempting to fold it. When folding be careful to see that the cloth is not pinched between any of the bows, or they will wear a hole in it very quickly. Always put the slip cover on when top is folded to keep out dust and dirt. The top is of the one-man type, and by loosening thumb screws which fasten same to the windshield and lifting front bow the top automatically recedes back into a folded position. "Lift the Dot" fasteners are used to hold the side curtains in place. When dot is next to the edge of curtain the natural way is to lift edge of curtain when curtain will be pulled away from the screw which holds it.

Fasteners

LIFT THE DOT FASTENER

The "lift the dot" fastener is used to fasten the side curtains in place. To remove fastener from over stem, grasp the curtain just below the fastener as shown in cut and give it a sharp quick jerk.

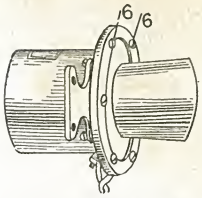


Speedometer For instructions on how to care for speedometer, see Stewart-Warner Speedometer Corporation's Speedometer Instruction Book.

ELECTRIC HORN

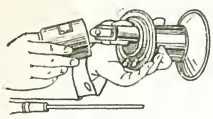
The motor driven electric horn is of sturdy construction and if the following instructions as to care are followed it will give long and continuous service.

TO CLEAN AND LUBRICATE

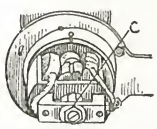


The six screws 6-6 attaching collar and projector need never be removed. If this is done be sure that they are screwed in tight when replaced.

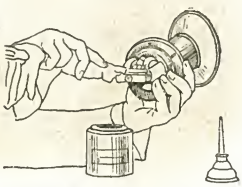
First take out the two screws A-A



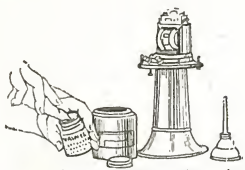
and then remove back shell.



The commutator is shown at C in this illustration.

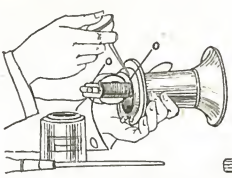


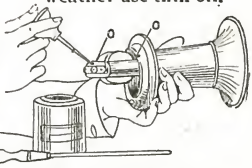
1—Take a dry cloth and wipe the commutator clean.



2—After commutator is thoroughly clean, apply a little vaseline or non-fluid oil to a clean part of the cloth. In cold weather use thin oil.

3—Then apply this to the commutator. The slightest film of lubricant is sufficient. An excess obstructs the flow of current.





Once a month a few drops of cylinder oil should be dropped into the two oil wells O-O shown in illustration. In cold weather use light machine oil.

TO ADJUST

First loosen lock-nut.
To do this apply wrench as shown in Figure I. Turn to position shown in Figure II.

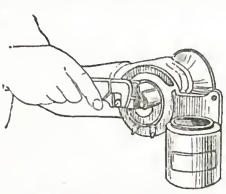


Figure I.—This illustration shows position of wrench when first put on lock-nut.

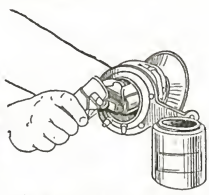
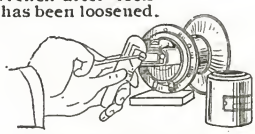
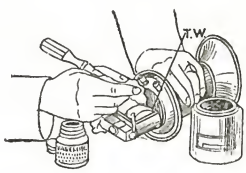


Figure II.—This illustration shows position of wrench after lock-nut has been loosened.

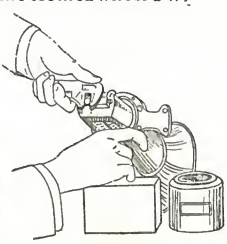
Then—after lock-nut is loose—start the current by pressing the push button. In other words, sound the signal. While it is sounding unscrew adjusting screw until no sound is heard except the buzzing of the motor. Then turn screw back until the note is loud and clear.



This illustration shows adjusting screw being unscrewed with a screwdriver. The wrench is holding loosened lock-nut.



Every three or four months a little non-fluid oil or vaseline should be applied to the toothed wheel TW.



When note is loud and clear tighten lock-nut. Be sure to set it up tight.

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